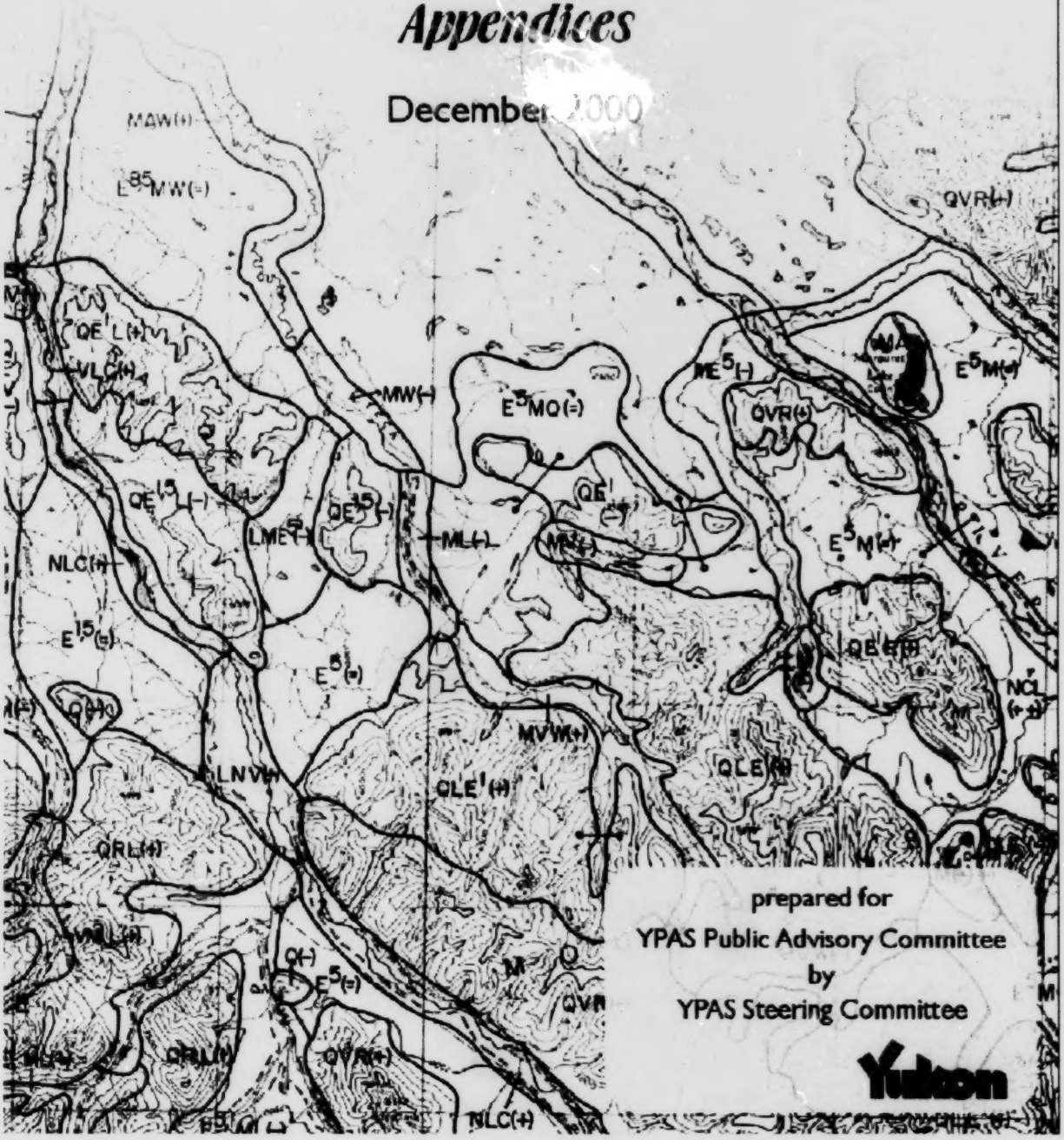
Yukon Protected Areas Strategy

Implementation Review

Appendices

December 2000



Yukon Protected Areas Strategy

Implementation Review

Appendices

December 2000

prepared for
YPAS Public Advisory Committee

by
YPAS Steering Committee

102-04623/

YUKON PROTECTED AREAS: STRATEGY IMPLEMENTATION REVIEW

APPENDIX 1: DRAFT OPERATING PROCEDURES
FOR THE GOAL 1 YPAS PROCESS

Table of Contents

INTRODUCTION 3

GENERAL PROCEDURES 3

DETAILED PROCEDURES FOR STEPS 1 – 8 (Table 1) 4

Step 1A: Determine Priority Ecoregions 5

Step 1B: Identify Areas of Interest 7

Step 2: Establish the Local Planning Team 10

Step 3: Identify Proposed Study Area(s) 12

Step 4: Approve Study Area(s) & Interim Protection 15

Step 5: Design Protected Area Boundaries and Designation 16

Step 6: Refer Final Proposal to DAP 18

Step 7: Approve Protected Area Boundaries 18

Step 8: Designate and Permanently Withdraw Protected Area 19

4 QUARTERLY & ANNUAL REPORTS 21

APPENDIX 1: DRAFT PROCEDURES FOR GOAL 1 YPAS PROCESS

1.0 INTRODUCTION

The purpose of this report is to provide additional detail and clarify procedures regarding the YPAS process for establishing Goal 1 protected areas. It presents detailed operating procedures for Steps 1 to 8 of the process, from selecting priority ecoregions for protected areas planning to designating the new protected areas. Procedures for Steps 9 – 11, management planning, are being developed separately.

This paper was prepared according to a technically rigorous and thorough process. It is based on YPAS experience since December 1998, when the strategy was adopted by the Yukon Government. Following Cabinet direction, the First Nation and YPAS Public Advisory Committee recommendations will be used to refine the procedures. Government departments and Local Planning Teams will then use these procedures as guidelines for implementing the YPAS process.

The steps and procedures in this report are consistent with the strategy. Some wording changes are suggested to provide clarity. The procedures are based on protected areas planning experiences over the last 18 months and will be updated from time to time to reflect lessons learned from future experiences.

The paper begins with general procedures that will be applied to the YPAS process, followed by detailed procedures to be applied for each step in the process. A short introduction to each step summarizes factors to be considered as specified in the strategy. Required products and anticipated time frames for each step are also provided. The final section of this paper describes procedures for preparing annual reports.

2.0 GENERAL PROCEDURES

The following general procedures are suggested for all steps in the YPAS process:

- A period of 30-60 days will be provided for public comment for each of the three key steps in the process - identifying *areas of interest*, selecting a *study area* and designing final *protected area boundaries*
- Local Planning Team (LPT) meetings will generally be held in the local communities affected, with public open houses in Whitehorse and/or other communities
- LPT meetings will be open to the public and announced in advance in newsletters and advertising
- The number of planning initiatives undertaken at any one time will be determined by staff and budget resources available and will be described in the annual YPAS report discussed at the end of this paper
- Local and traditional knowledge will be incorporated along with scientific data and information where possible, for example in the ecological, cultural and socio-economic assessments and through community meetings with the LPT
- Estimated times required to complete the steps depend on the level of information available (in some cases one to two field seasons may be required to complete research and assessments) and departmental workloads.
- Circumstances may warrant advancing the process (e.g. where few resource overlaps exist). The decision to adjust the process will require broad public support and will be made by the Ministers of Renewable Resources and Economic Development (see *Technical Paper #3*). The decision would be reflected in a *scoping document* describing the context, assumptions and key issues to be considered in the planning process. The document will be prepared by government in consultation with the affected First Nation and reviewed by the Local Planning Team.

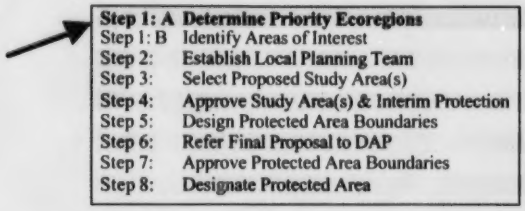
3.0 DETAILED PROCEDURES FOR STEPS 1- 8 IN THE YPAS PROCESS

The following table lists the key tasks for steps 1 - 8 of the YPAS process. Procedures for carrying out these tasks are covered in the following pages of this paper.

YPAS STEPS		PUBLIC INPUT	TYPE OF ASSESSMENTS	* Estimated Time
Step 1	**A. Determine Priority Ecoregions** • **Review Existing Data** • **Discuss with Others** • **Identify Priority Ecoregions**			***4 – 6 months**
	B. Identify Areas of Interest • Assess Natural Values • Identify Key Issues and Interests • *(applying broad value assessments)* • Identify Initial Areas of Interest		• *Focus on natural & cultural values* • *Mineral, oil and gas and other resources (e.g. forestry) to identify and avoid conflicts where options exist*	*4 – 12 months
Step 2	**Build Local Partnerships - Establish the LPT** • **Prepare for Local Planning Team** • **Establish Local Planning Team**			***3 – 6 months**
Step 3	**Select Proposed Study Area(s)** • Confirm Areas of Interest *Public Workshop #1* • Evaluate Areas of Interest • Propose Study Area(s) *Public Workshop #2* • *(applying more detailed value assessments)*	? ? ?	• *Detailed natural, cultural, resource and economic field work and assessments*	*6 - 12 months
Step 4	**Approve Study Area(s) & Interim Protection** • **Refer Study Area Proposal for Review and Cabinet Approval**			***2 – 3 months**
Step 5	**Design Protected Area Boundaries** • Collect Additional Information • *(applying final detailed value assessments)* • Develop Final Proposal *Public Workshop #3*	?	• *Additional detailed natural, resource and economic values if required*	*3 – 4 months
Step 6	**Refer Final Proposal to DAP**			***1 – 2 months**
Step 7	**Approve Protected Area Boundaries** • Refer Final Proposal for Review and Cabinet Approval			*2 – 3 months
Step 8	**Designate & Permanently Withdraw Protected Area** • **Prepare Legal Boundary Descriptions** • **Apply for Land Transfer & Permanent Withdrawal** • **Make Final Designation**			***6 - 12 months**

**Because these steps overlap, no attempt should be made to add the estimated times. Overall completion of the first seven steps, from identification to approval of protected areas, should take between 12 to 24 months.*

STEP 1: A. DETERMINE PRIORITY ECOREGIONS FOR PROTECTION


Step 1: A Determine Priority Ecoregions
Step 1: B Identify Areas of Interest
Step 2: Establish Local Planning Team
Step 3: Select Proposed Study Area(s)
Step 4: Approve Study Area(s) & Interim Protection
Step 5: Design Protected Area Boundaries
Step 6: Refer Final Proposal to DAP
Step 7: Approve Protected Area Boundaries
Step 8: Designate Protected Area

Factors to be Considered

The first step in the YPAS process, as specified in *YPAS Technical Paper #3: Planning and Establishing Protected Areas,* is to identify priority ecoregions for protected areas planning. The following criteria will be used to select priority ecoregions for planning:

- traditional territories where final agreements are in effect and RRCs established;
- Local First Nations and RRCs interested in planning and establishing protected areas;
- data already exists or data collection has already begun;
- there is potential to create partnerships with other agencies and governments in planning and/or establishing protected areas (e.g. Parks Canada);
- a regional land use planning process exists or is being developed;
- where potential areas for ecoregion representation have already been identified (e.g. IBP sites, sites identified through Land Use Planning); and
- ecosystems are at risk of being fragmented or destroyed (e.g. there are significant land and/or resource dispositions pending).

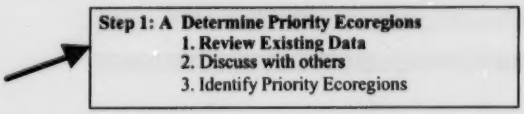
General Steps to be Followed

Technical Paper #3 identifies general steps involved in identifying priority ecoregions as:

1. Government review of existing data on protected areas values, resource interests and related issues;
2. Identification of ecoregions which are not adequately represented;
3. Discussions with affected First Nations and Renewable Resource Councils to determine level of local interest in planning; and
4. Initial assessment of stakeholder and NGO interests.

Detailed Procedures

1. Review existing data on protected areas values, resource interests and related issues:



The YPAS secretariat, in consultation with appropriate territorial and federal departments (e.g. Renewable Resources, Economic Development, Heritage Branch, Environment Canada, Parks Canada, Indian and Northern Affairs, Fisheries and Oceans), will:

a) Identify the following:
   - traditional territories where land claims are settled;
   - ecoregions with little or no representation;

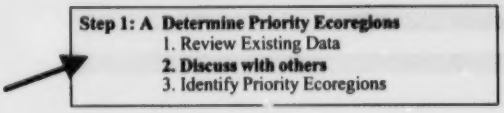
- areas where regional scale data is available (ecological, cultural, resource values);
- areas where potential areas of interest for protection are known to exist;
- areas where conflicting land use pressures/risks may exist; and
- areas with potential to create partnerships with other agencies in protected areas planning.

b) Compile maps with the above information and identify potential priority ecoregions for protected areas planning.

c) Prepare a draft *priority ecoregions report* incorporating the factors listed above (text and maps) and recommendations.

d) Establish a government working group to review the draft priority ecoregion report and revise it based on comments received.

2. Discuss with others



The secretariat and other departments, in consultation with affected First Nations, boards and councils and stakeholders, will:

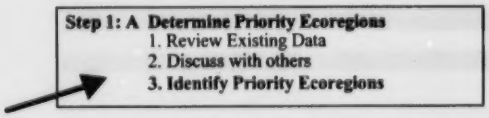
a) Determine level of interest, through discussions with RRC's and First Nations, for planning in areas identified above.

b) Identify related planning efforts in the area, such as Land Use Planning Commission initiatives, for potential coordination/cooperation.

c) Determine stakeholders' interest in proceeding with planning and identify interests and issues.

d) Incorporate results of these discussions in the draft priority ecoregions report.

3. Identify priority ecoregions



Based on the above information, the secretariat, in consultation with other departments, will:

a) Prepare final recommendations for identifying:
   i. Priority ecoregions for protected areas planning,
   ii. Areas requiring additional research and/or additional consultations to prepare for future planning.

b) Finalize the analysis and recommendations.

c) Prepare final priority ecoregions report.

d) Incorporate the identified priority ecoregions into the work plan and annual report that will be submitted to the Yukon Government for approval annually.

Products

In this step, the following will occur:

- Develop a Priority Ecoregions Report.

Time Frame

This step will take an anticipated 4 – 6 months once regional-level data and information is available and should be completed in time to be included in the YPAS annual work plan and update report due each January.

STEP 1: B. IDENTIFY AREAS OF INTEREST

Step 1: A	Determine Priority Ecoregions
Step 1: B	**Identify Areas of Interest**
Step 2:	Establish Local Planning Team
Step 3:	Select Proposed Study Area(s)
Step 4:	Approve Study Area(s) & Interim Protection
Step 5:	Design Protected Area Boundaries
Step 6:	Refer Final Proposal to DAP
Step 7:	Approve Protected Area Boundaries
Step 8:	Designate Protected Area

Factors to be Considered

After ecoregions have been selected, initial areas of interest for protected area planning are identified for the ecoregion(s). YPAS Technical Paper #3 establishes tasks and criteria for identifying these initial areas of interest, which will then be referred to the Local Planning Team for public input and confirmation in Step 3.

The definition of an area of interest is stated as: *an area defined early on in the planning process as potentially meeting the criteria for protection.* YPAS states that several areas of interest may be identified but not all areas will automatically become protected and *in some cases only one will eventually be protected and in other cases two or more smaller areas may be chosen.*

While areas of interest under this process are primarily identified for Goal 1 areas (which receive a high level of legislated protection), in some cases Goal 2 areas may also be included (*YPAS Technical Paper #2*).

General Steps to be Followed

The general steps to be followed in identifying initial areas of interest involve:

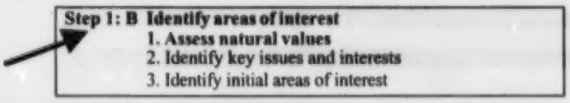
- Work with First Nations, municipal governments and RRCs to identify local issues and interests related to protected areas planning.
- Assemble information on the natural values of the ecoregion(s) from all available sources including local and traditional knowledge.
- Identify and articulate the key natural values and features that make up the biological diversity and ecological integrity of the ecoregion.
- Assemble relevant information on resource assessments, third party interests and related social and economic issues.
- Identify interdepartmental and intergovernmental issues and interests.

- Identify initial areas of interest based on the *Natural Values Assessment Criteria and Guidelines Technical Paper.*

Cabinet may, in some cases, request a map notation or land reservation on the different *areas of interest* to notify the review agencies and potential developers that areas are being considered for protection (*Technical Paper #6*).

Detailed Procedures

1. Assess natural values from all sources


Step 1: B Identify areas of interest
1. Assess natural values
2. Identify key issues and interests
3. Identify initial areas of interest

The YPAS secretariat, in consultation with territorial and federal departments, will establish a *government working group* based on terms of reference specific to the project. The working group will assist the secretariat to:

a) Identify all assessment requirements for the project and identify other research needs, budgets and schedules for completing research and assessments.

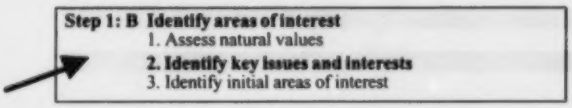
b) Complete natural values assessments, based on the *YPAS Natural Values Assessment Criteria and Guidelines* technical paper.

c) Consider cultural values through Heritage Branch assessment and consultations with First Nations.

d) Prepare background assessment report and maps to describe the planning area/ecoregion(s) and the natural values criteria used in the assessments.

e) Identify potential areas of interest based on the background report and maps.

2. Identify key issues and interests


Step 1: B Identify areas of interest
1. Assess natural values
2. Identify key issues and interests
3. Identify initial areas of interest

The secretariat and government working group will:

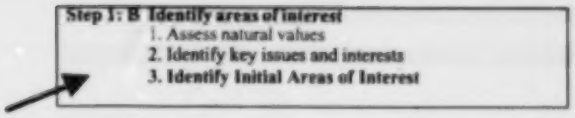
a) Prepare and compile the regional resource assessments for mineral, oil and gas, forestry, tourism, recreation and other affected sectors based on YPAS criteria and the technical assessment guidelines described for each sector in Appendix 2.

b) Identify and map third party interests.

c) Identify local issues and interests, in consultation with affected First Nations, RRCs, and others (e.g. LUP Council and Commissions, key stakeholders).

d) Compile resource assessments and value maps with potential areas of interest to identify:
- areas of interest with no apparent conflicting values;
- areas of interest with apparent conflicting values (e.g. areas with high resource potential);
- key issues and interests related to the proposed areas of interest; and
- potential options to address these issues.

3. Identify Initial Areas of Interest


Step 1: B Identify areas of interest
1. Assess natural values
2. Identify key issues and interests
3. Identify Initial Areas of Interest

The secretariat and government working group will:

a) Develop initial areas of interest options based on the assessments prepared in the above step;

b) Identify and schedule additional research/assessments;

c) Prepare an areas of interest options paper identifying and rationalizing initial areas of interest.

Products

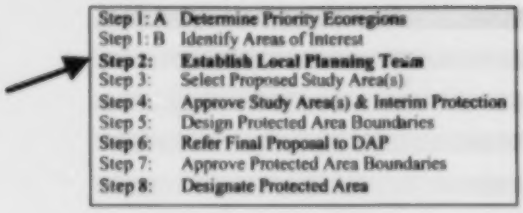
In this step, the following will occur:

- Establish a government working group for the project;
- Prepare background values and assessment report and annotated values and assessment maps; and
- Prepare draft areas of interest options paper.

Time Frames

This step will take an anticipated 4 – 12 months to complete, and possibly more time depending on whether additional field research is required.

STEP 2: ESTABLISH THE LOCAL PLANNING TEAM


Step 1: A Determine Priority Ecoregions
Step 1: B Identify Areas of Interest
Step 2: Establish Local Planning Team
Step 3: Select Proposed Study Area(s)
Step 4: Approve Study Area(s) & Interim Protection
Step 5: Design Protected Area Boundaries
Step 6: Refer Final Proposal to DAP
Step 7: Approve Protected Area Boundaries
Step 8: Designate Protected Area

Factors to be Considered

Step 2 involves preparing reference documents (e.g. scoping document, terms of reference) to guide the public planning process and establishing the Local Planning Team (LPT) to lead the public process. The roles and responsibilities of the LPT are established in *Technical Paper #1*.

General Steps to be Followed

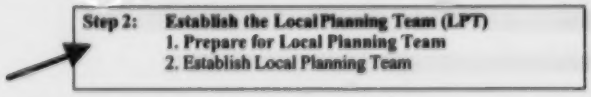
The areas of interest options paper and other reference documents to be used by the LPT will be submitted to the Minister of Renewable Resources for review and approval to proceed with the public process. The Minister may recommend Cabinet approve a request to the federal government to establish map notations for the areas of interest according to *Technical Paper #6*.

The current process provides that, following approval by the Minister to proceed, and in consultation with the government working group and the local First Nations(s) and Renewable Resources Council(s), the secretariat would establish the Local Planning Team (LPT) to lead the public process for protected areas planning. The affected RRC (or First Nation if an RRC is not established) would be invited to co-chair the LPT along with a YPAS secretariat member. Together the co-chairs, in consultations with the governments involved, would determine non-government organizations or groups to be invited to participate on the LPT. Each organization will select its own representative to the LPT (*Technical Paper #1*).

The detailed procedures below describe how these steps would be conducted. Section 3.5 of the discussion paper, however, makes a number of suggestions concerning changes related to the role of the Yukon Government in establishing and participating on the Local Planning Team. If after the review, decisions are made to make these or other changes, then this section will be amended accordingly.

Detailed Procedures

1. Prepare for establishing the Local Planning Team



The secretariat, in consultation with the government working group, will:

a) In consultation with the First Nation, prepare draft documents to be used by the LPT including:

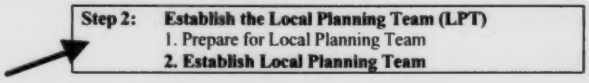
- Scoping document (identifies LPT mandate, planning context, parameters, principles, assumptions, key issues)

- Project work plan (identifies tasks, schedule, budget)
- LPT terms of reference (identifies roles, responsibilities, operating guidelines)
- Communication/consultation plan (identifies audiences, messages, methods)

b) Submit a package including above documents and the areas of interest options paper to the Minister of Renewable Resources requesting approval to begin the public process.

Where deemed appropriate, the Minister may request Cabinet to request the federal government to establish map notations or land reservations for areas of interest.

2. Establish Local Planning Team (LPT)



The secretariat, in consultation with the government working group, will:

a) In consultation with the First Nation and RRC, prepare invitations to planning partners (e.g. First Nation, RRC, community, conservation, and resource and tourism industry interests) to submit names of representatives to the LPT.

b) Convene the first LPT meeting for orientation, including:
   - review government directions in the scoping document,
   - review and approve terms of reference, work plan and communications plan,
   - establish agendas for the LPT meeting and public workshop #1, and
   - provide background material to the LPT concerning the planning process.

c) Provide LPT with the areas of interest options paper to review for next meeting.

d) Discuss with the LPT how local and traditional knowledge may be incorporated into the planning process.

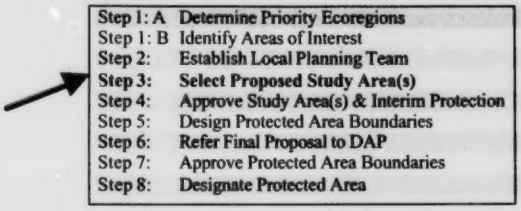
Products

In this step, the following products will be prepared:
- scoping document
- project work plan
- LPT terms of reference
- communication/consultation plan

Time Frames

This step will take an anticipated 2 - 6 months to complete.

STEP 3: IDENTIFY PROPOSED STUDY AREA(S)


Step 1: A Determine Priority Ecoregions
Step 1: B Identify Areas of Interest
Step 2: Establish Local Planning Team
Step 3: Select Proposed Study Area(s)
Step 4: Approve Study Area(s) & Interim Protection
Step 5: Design Protected Area Boundaries
Step 6: Refer Final Proposal to DAP
Step 7: Approve Protected Area Boundaries
Step 8: Designate Protected Area

Factors to be Considered

Technical Paper #3 specifies that the Local Planning Team will start the public planning process, evaluate the initial areas of interest and identify a proposed study area. Two public workshops will be held during this step.

A study area is defined as *a specific area that is being formally proposed for protection*. In some cases, depending on the natural values of the ecoregion(s) and other competing values, more than one study area may be recommended. After the areas of interest are confirmed or adjusted, a study area will be selected and a study area proposal will be prepared and include:

- An evaluation of how well the area meets the criteria for ecoregion representation;
- A review of the results of the ecological, resource and socio-economic assessments and public consultations completed to date;
- Proposed study area(s) boundaries;
- Proposed level of protection and designation/legislation for the protected area;
- Identification of management objectives; and
- Identification of requirements for interim protection (*Technical Paper #6*).

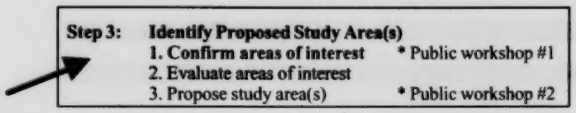
General Steps to be Followed

Step 3 involves the following procedures:

- Review initial areas of interest with the public, add local and traditional knowledge information, interests, issues (hold public workshop #1);
- Provide the public the opportunity to suggest other areas of interest that meet the criteria for ecoregion representation;
- Conduct more detailed resource assessments to identify competing resource interests in the areas of interest being considered;
- Identify the environmental, social and economic implications of protecting the areas of interest;
- Evaluate the implications of the different areas of interest according to criteria for ecoregion representation, resource and socio-economic assessments; and
- Select a study area and develop a study area proposal through consultation with the public (hold public workshop #2).

Detailed Procedures

1. Confirm Areas of Interest


Step 3: Identify Proposed Study Area(s)
1. Confirm areas of interest
* Public workshop #1
2. Evaluate areas of interest
3. Propose study area(s)
* Public workshop #2

The secretariat, with the assistance of the government working group and LPT, will:

a) Prepare draft announcements about starting the public process;

b) Prepare and mail newsletter #1 (include background, context, issues, options, rationale, ways to have input, next steps);

c) Advertise public meeting (e.g. radio, newspaper, local flyers);

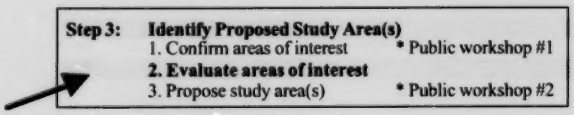
d) Convene the second LPT meeting to:
   - review areas of interest options paper,
   - hold public workshop #1 to gather public input,
   - consider public input,
   - recommend final areas of interest;

e) Revise areas of interest options paper based on LPT recommendations; and

f) Forward final areas of interest options paper to the Minister of Renewable Resources for review and approval.

g) Minister may recommend Cabinet approve request to the federal government to establish map notations for the areas of interest.

2. Evaluate Areas of Interest


Step 3: Identify Proposed Study Area(s)
1. Confirm areas of interest
* Public workshop #1
2. Evaluate areas of interest
3. Propose study area(s)
* Public workshop #2

The secretariat and the government working group, will:

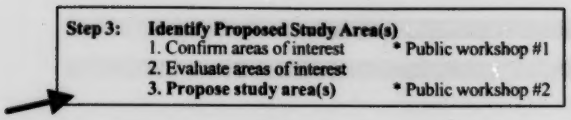
a) Prepare and compile the ecological, resource and socio-economic assessments that are required to evaluate the areas of interest;

b) Describe the relative merits of areas of interest taking into account all the value assessments completed in a) (using YPAS multiple accounts analysis procedures);

c) Draft a *technical assessment report* for government review and comments; and

d) Present a technical assessment report to LPT for review and comments.

3. Propose Study Area(s)


Step 3: Identify Proposed Study Area(s)
1. Confirm areas of interest
* Public workshop #1
2. Evaluate areas of interest
3. Propose study area(s)
* Public workshop #2

The secretariat, with the assistance of the government working group and in consultation with the LPT, will:

a) Convene the third LPT meeting to:
   - review assessment report
   - develop study area options;

b) Draft a *study area options paper*;

c) Circulate draft study area options paper for LPT review and approval;

d) Prepare and mail out newsletter #2 (includes where we are in the process, summary of key comments, study area options, rationale, what's next, how to make comment);

e) Convene LPT meeting to:
   - Prepare and hold public workshop #2 to gather public input,
   - Consider all public input (from newsletter responses and workshop), identify issues and options for addressing them,
   - develop recommendations for final study area(s);

f) Prepare a draft *study area proposal* in consultation with the LPT;

g) Circulate draft study area proposal for LPT review and comments;

h) Prepare final study area proposal for LPT approval.

Products

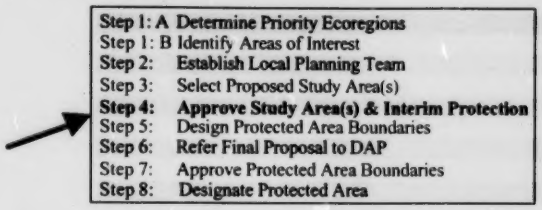
In this step, the following products will be prepared:

- Newsletter #1 mailout
- Final areas of interest options paper
- Technical assessment report
- Draft study area options paper
- Newsletter #2 mailout
- Draft study area proposal
- Final study area proposal

Time Frames

This step will be important and require sufficient time as it involves two public consultation phases to confirm the areas of interest and to identify study area(s). It will likely take 6 - 12 months to complete, and possibly more depending on additional field work needs that may be identified.

STEP 4: APPROVE STUDY AREA(S) & INTERIM PROTECTION


Step 1: A Determine Priority Ecoregions
Step 1: B Identify Areas of Interest
Step 2: Establish Local Planning Team
Step 3: Select Proposed Study Area(s)
Step 4: Approve Study Area(s) & Interim Protection
Step 5: Design Protected Area Boundaries
Step 6: Refer Final Proposal to DAP
Step 7: Approve Protected Area Boundaries
Step 8: Designate Protected Area

Factors to be Considered

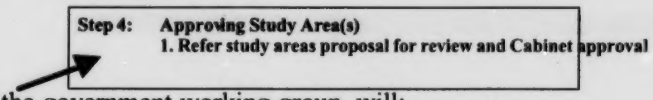
Once completed by the Local Planning Team, the proposal for a study area will be recommended to government for approval.

General Steps to be Followed

The study area proposal will be referred for Cabinet approval. Upon Cabinet approval, the Yukon government will identify the level of interim protection required and submit requests to the federal government and appropriate Yukon government departments to establish interim protection for the study area, according to YPAS guidelines and processes (*Technical Paper #6*).

Detailed Procedures

1. Refer study area proposal for review and Cabinet approval



The secretariat, with the assistance of the government working group, will:

a) Prepare the Cabinet submission to transmit LPT recommendations to Cabinet;

b) Submit the proposal to the Minister of Renewable Resources for Cabinet review and approval of the study area(s) and federal application for interim protection;

c) Following Cabinet approval, prepare request for interim protection (for proposed Goal 1 areas) and map notation or interim protection (for proposed Goal 2 areas) to the federal government (e.g. for minerals) and appropriate territorial departments if necessary (e.g. for oil and gas) - and removal of any map notations (if any) from areas of interest options not in the study area(s);

d) Make a public announcement related to the approval and next steps according to the communication plan.

Products

In this step, the following products will be prepared:

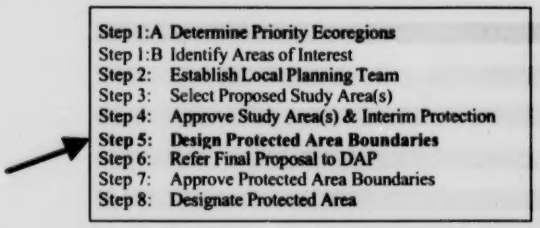
- Cabinet submission for study area approval
- Application for interim protection to federal government (e.g. minerals) and territorial departments (e.g. oil and gas)

Time Frame

Preparation of Cabinet submission and referral to the Minister and Cabinet for review and

approval usually takes from 2 – 3 months.

STEP 5: DESIGN PROTECTED AREA BOUNDARIES AND DESIGNATION


Step 1:A Determine Priority Ecoregions
Step 1:B Identify Areas of Interest
Step 2: Establish Local Planning Team
Step 3: Select Proposed Study Area(s)
Step 4: Approve Study Area(s) & Interim Protection
Step 5: Design Protected Area Boundaries
Step 6: Refer Final Proposal to DAP
Step 7: Approve Protected Area Boundaries
Step 8: Designate Protected Area

Factors to be Considered

Upon Cabinet approval of the study area(s), the LPT will consider additional local input and finalize the proposal for the protected area. This step addresses detailed issues affecting boundary design of the protected area and will not usually result in major changes from the study area. It will result in recommended final protected area boundaries.

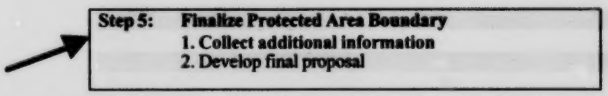
General Steps to be Followed

Finalizing the protected area boundaries will involve the following steps (*Technical Paper #3*)

- Collect and incorporate additional input relating to local and traditional knowledge and stakeholder issues and concerns;
- Complete additional detailed resource assessments as required;
- Finalize proposed boundaries and proposed designation (e.g. under the *Yukon Parks Act*, *Yukon Wildlife Act* or other federal legislation or policy);
- Develop initial management objectives for the area;
- Public review and input (public workshop #3); and
- Intergovernmental review and input.

Detailed Procedures

1. Collect Additional Information

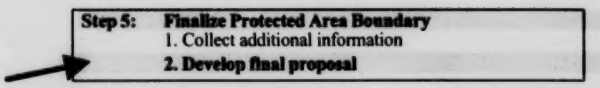


The secretariat and government working group, will:

a) Schedule and complete any further research and assessments needed to identify final boundaries and management issues;

b) Prepare final *protected area issues and options paper* for review and comment by the LPT.

2. Develop final proposal



The secretariat, with the assistance of the government working group and LPT, will:

a) Convene LPT meeting to:

- review issues and options paper,
- make recommendation for final boundaries, level of protection, designation, protected area objectives,
- plan public consultation;

b) Prepare draft *final protected area proposal* for review and LPT approval;

c) Prepare and distribute newsletter #3 (description of study area, key issues, proposed final boundaries, level of protection, designation, protected area objectives, rationales, ways to comment, what's next);

d) Convene LPT meeting to:

- hold public workshop #3 to review draft final protected area proposal,
- consider public input,
- recommend final protected area boundaries, level of protection, designation, protected area objectives;

e) Prepare final protected area proposal including boundaries for review and LPT approval.

Products

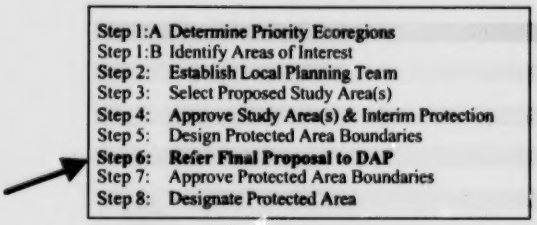
In this step, the following products will be prepared:

- Protected area issues and options paper
- Protected area proposal (boundary, designation, initial management objectives)

Time Frames

This step in the process may require further field work which could affect the time required, however under normal circumstances it should take 3 – 4 months to complete the tasks.

STEP 6: REFER FINAL PROPOSAL TO DAP


Step 1:A Determine Priority Ecoregions
Step 1:B Identify Areas of Interest
Step 2: Establish Local Planning Team
Step 3: Select Proposed Study Area(s)
Step 4: Approve Study Area(s) & Interim Protection
Step 5: Design Protected Area Boundaries
Step 6: Refer Final Proposal to DAP
Step 7: Approve Protected Area Boundaries
Step 8: Designate Protected Area

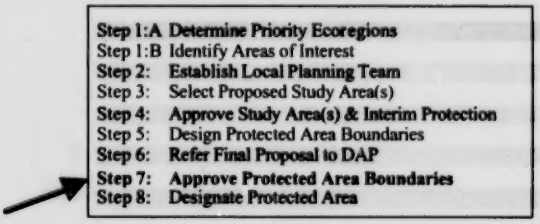
Criteria/Factors to be Considered

This step will not take effect until new Development Assessment Process legislation and regulations are completed. Once completed, the final protected area proposal will be referred to DAP for final review prior to being submitted to Cabinet. This review will be consistent with the DAP legislation now being developed.

Planning steps 1 - 5 will be undertaken in consultation with DAP officials and will result in a proposal that meets the requirement for the DAP review. It is therefore expected that the DAP review will be completed expeditiously (1 - 2 months).

Specific procedures will be developed in the future in conjunction with DAP implementation.

STEP 7: APPROVE PROTECTED AREA BOUNDARIES


Step 1:A Determine Priority Ecoregions
Step 1:B Identify Areas of Interest
Step 2: Establish Local Planning Team
Step 3: Select Proposed Study Area(s)
Step 4: Approve Study Area(s) & Interim Protection
Step 5: Design Protected Area Boundaries
Step 6: Refer Final Proposal to DAP
Step 7: Approve Protected Area Boundaries
Step 8: Designate Protected Area

Factors to be Considered

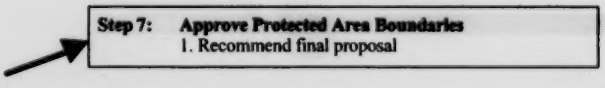
When approved by the LPT and through DAP, the final protected area proposal will be recommended by the LPT to government.

General Steps to be Followed

The final protected area proposal will be submitted to the Minister of Renewable Resources for Cabinet final review and approval.

Detailed Procedures

1. Recommend final proposal



The secretariat, with the assistance of the government working group, will:

a) Prepare Cabinet submission to forward the LPT final protected area recommendations to Cabinet;

b) Submit the proposal to Cabinet for approval of final protected area boundaries, level of protection, designation and initial management objectives, and federal and territorial applications for permanent protection;

c) Prepare request for federal land transfer and permanent surface and subsurface land withdrawals.

Products

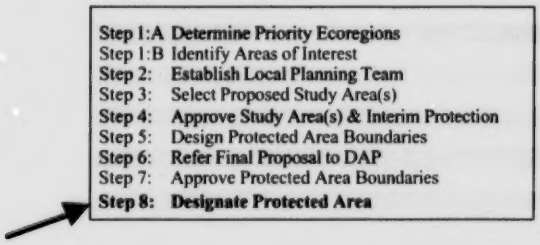
This step will result in:

- Cabinet approval of the protected area(s)

Time Frames

Preparation of Cabinet submission and referral to the Minister and Cabinet for review and approval usually takes from 2 – 3 months.

STEP 8: DESIGNATE AND PERMANENTLY WITHDRAW PROTECTED AREA


Step 1:A Determine Priority Ecoregions
Step 1:B Identify Areas of Interest
Step 2: Establish Local Planning Team
Step 3: Select Proposed Study Area(s)
Step 4: Approve Study Area(s) & Interim Protection
Step 5: Design Protected Area Boundaries
Step 6: Refer Final Proposal to DAP
Step 7: Approve Protected Area Boundaries
Step 8: Designate Protected Area

Factors to be Considered

Following Cabinet approval, the protected area will be designated as required under the appropriate legislation. Before formal designation can be completed by the Yukon government, several technical and legal requirements must be completed by the federal government:

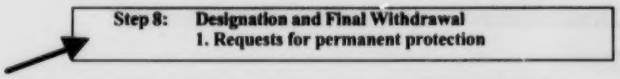
- Areas cannot be designated under the *Yukon Parks Act* or other Yukon legislation until after the land is transferred to the Yukon government.
- A legal technical description of the protected area to be transferred is approved by the federal Natural Resources.
- In the absence of general regulations under appropriate Yukon legislation the land may be protected through an "administrative hold" on permitting under *the Yukon Lands Act* or *Parks Act*, or through interim 'emergency' regulations under the *Yukon Environment Act*.
- Permanent mineral withdrawal usually happens at the same time as the land is transferred or is requested separately.

General Steps to be Followed

Legal boundary descriptions must be prepared, and lands transferred from the crown (federal) to the commissioner (territorial). The federal Privy Council must approve permanent withdrawal of subsurface mineral rights. Permanent withdrawals of land from surface activities (e.g. oil and gas withdrawals, Territorial Lands Act dispositions, etc.) will proceed through appropriate Yukon government departments.

Detailed Procedures

1. Request for permanent protection



The secretariat, with the assistance of the government working group, will complete the following:

a) Prepare a final administrative plan, based on final boundaries approved by Cabinet, which will provide the legal description of the final protected area boundaries;

b) Sign off the administrative plan by the Department of Renewable Resources after appropriate departments are briefed (e.g. Economic Development, Communications and Transportation Services (C&TS) and Tourism);

c) Forward plan to C&TS with a letter asking them to request DIAND Lands to prepare two Orders In Council to transfer the lands and permanently withdraw the area from mineral staking – a copy of the draft work plan for the management planning will be forwarded with the O.I.C. to the Privy Council along with a summary of consultations and consideration for the boundaries;

d) Renewable Resources will send administrative plan and a letter to Economic Development asking for a permanent oil and gas withdrawal if required;

e) Following land transfer to the Yukon government, C&TS may prepare an administrative hold to "freeze" all permitting or interim emergency regulations under the *Yukon Environment Act* to manage limited land use until a management plan is approved;

f) Renewable Resources will prepare the protected area designation for Cabinet.

Products

In this step, the following will be completed:

- Legal descriptions
- Request for permanent protection
- Final land transfer
- Final designation of protected area

Time frames

This step will take from 8 - 12 months to prepare and complete.

4.0 QUARTERLY AND ANNUAL YPAS REPORTS

Factors to be Considered

Annual *work plans* are required as described in *Technical Paper # 7: Reviewing and Updating the Strategy*. The annual review will identify the work, progress and products completed to date, identify key issues and concerns and set work priorities for the coming years. This annual review and work plan update will be prepared by the YPAS secretariat and described in an *annual report*, which will be made available to the public with the assistance of the government working group.

General Steps to be Followed

The annual reviews will be prepared by the secretariat, in consultation with the following governments, agencies and groups involved in the process (p.1):

- Federal and Territorial government departments and agencies
- First Nation governments
- Established Local Planning Teams
- Mandated boards and councils
- Key stakeholder groups

Detailed Procedures

Preparing Annual YPAS Reports

The secretariat, with the assistance of the government working group and others actively involved in implementation as listed above (p.1), will:

a) Prepare an annual report that reviews and updates the YPAS work plan. The report will include a summary of progress and products competed to date, key issues and concerns, projected planning work for the following two years, and 2-5 year projections for required research and data collection;

b) Refer the annual report to the government working group for review and comments and revise the report as necessary;

c) Submit the annual report to the Minister of Renewable Resources for review and approval;

d) Prepare a *communications plan* for public release of the annual report and print and distribute the report.

Products

In this step, the following products will be prepared:

- Quarterly Progress Reports
- Annual Work Plan Report

Time Frame

Brief progress reports to monitor and summarize the progress of YPAS implementation will be prepared every three months and submitted to the Minister for review. The workplan to guide the implementation will be reviewed and updated on an annual basis. Quarterly reports will be prepared approximately April/July/October and annual reports and workplans in January.

Yukon Protected Areas Strategy: Implementation review

APPENDIX 2: RESOURCE/VALUES ASSESSMENT SUMMARY REPORTS

Table of Contents

APPENDIX 2.1: NATURAL VALUES ASSESSMENT SUMMARY.....23

APPENDIX 2.2: FOREST RESOURCES ASSESSMENT SUMMARY REPORT.....34

APPENDIX 2.3: CULTURAL/HERITAGE RESOURCES ASSESSMENT SUMMARY.....39

APPENDIX 2.4: MINERAL RESOURCES ASSESSMENT SUMMARY.....43

APPENDIX 2.5: OIL AND GAS RESOURCES ASSESSMENT SUMMARY.....47

APPENDIX 2.6: RECREATION RESOURCES ASSESSMENT SUMMARY.....52

APPENDIX 2.7: RENEWABLE ENERGY RESOURCES ASSESSMENT SUMMARY.....58

APPENDIX 2.8: TOURISM ASSESSMENT SUMMARY.....67

APPENDIX 2.9: TRANSPORTATION ASSESSMENT SUMMARY.....73

APPENDIX 2.10: OTHER ECONOMIC VALUES RESOURCE ASSESSMENT.....77

Note:
These assessment descriptions are based on methodologies used in other jurisdictions and on the best technical information available in the scientific literature. Whenever possible, these assessments will incorporate traditional and local knowledge. The methodologies will continue to evolve as new and improved techniques and approaches emerge. While these assessment papers will guide the technical work of government departments, they do not necessarily reflect Yukon Government policy with respect to how final decisions are made related to the establishment of protected areas.

Appendix 2.1: Natural Values Assessment Summary

Prepared by: Yukon Protected Areas Secretariat, Renewable Resources, Yukon
October 2000

1.0 INTRODUCTION

1.1 The Yukon Protected Areas Strategy

The Yukon Protected Areas Strategy (YPAS) guides the creation of a network of protected areas. Selection of areas is based on the principles of conservation biology, ecosystem-based management, sustainable economies and the values and knowledge of Yukon people. The first priority of the YPAS is to protect representative Core Goal 1 areas within the Territory's twenty-three ecoregions. ***This technical summary describes the natural values criteria to be used to identify and assess Core Goal 1 areas for protection under YPAS.***

The Strategy provides a means for the Yukon Government to fulfill its commitments to preserving biodiversity under *Canada's Biodiversity Convention* and creating a scientifically based network of protected areas under the *Whitehorse Mining Initiative.* Furthermore the Strategy allows the territorial government to meet its public trust obligations under the *Yukon Environment Act* (1991) to protect the natural environment for the benefit of present and future generations.

The technical paper upon which this summary is based has been peer reviewed by a variety of specialists in conservation biology and protected areas planning in Canada including other governments, universities and non-government environmental groups. Reviewers expressed support for the approach used in the Yukon and provided useful additional technical comments that were incorporated into the paper. In an effort to advance the science, this summary and paper will be re-published in Spring 2001 in order to take into account the lessons learned from applying the approach described below.

1.2 The Role of Goal 2 Areas

In addition to Core Goal 1 areas, the Strategy provides for other types of protection, Goal 2 protected areas, which include:

- Habitat Protection Areas,
- Ecological Reserves,
- Canadian Heritage Rivers,
- Historic Sites and
- Canadian Wildlife Areas.

Following their own established planning processes, these designations can contribute to Core Goal 1 area objectives of protecting biodiversity and ecological integrity by providing for buffers zones and connecting corridors. ***Need*** and ***opportunity*** will be the key factors to determine which of these complementary designations will be applicable. As well Goal 2 areas on their own contribute to a territorial wide protected area network. The data and information collected and the assessments prepared for identifying Core Goal 1 areas will be equally useful for Goal 2 planning initiatives.

2.0 YUKON PROTECTED AREAS STRATEGY CONTEXT

2.1 Key Steps in the Planning Process for Establishing Protected Areas:

YPAS provides for three key initial steps in the planning process for protected areas:

1. Identify optional *Areas of Interest*,
2. Select *Study Area*, and
3. Design *Final Boundaries*.

Before starting the planning process for an ecoregion, the Yukon Government approves the YPAS work plan that identifies which priority ecoregion(s) will be considered for protected areas planning.

Based on that direction, the following process is used by the YPAS Secretariat to coordinate the **identification of initial *Areas of Interest***, the first key step in the YPAS planning process:

1. Review research needs based on assessment criteria
2. Review existing data and information
3. Identify critical data and information gaps
4. Design field research program
5. Conduct field research program (1-3 seasons / $50,000-$300,000 based on multi-agency cost sharing and partnership opportunities)
6. Assemble and integrate data and information (geo-spatial data base, map overlay techniques, gap analysis technique, 2-way summary matrix(s), etc.)
7. Review and assess assembled data and information by technical/local/traditional knowledge expert panel (multi-disciplinary team, 1-3 day workshop, etc.)
8. Identify possible *Areas of Interest*
9. Overlay other resource value assessments and interests with possible *Areas of Interest* (work and develop consensus with other departments and partners)
10. Identify initial areas of interest for protection in the ecoregion(s)

After initial *Areas of Interest* are identified, a public review of these options are considered through the establishment of a ***Local Planning Team***, which consists of:

- First Nation, territorial and municipal governments,
- Renewable Resource Council,
- local resource and tourism industry and
- conservation representatives.

A smaller, more defined area, the ***Study Area***, is then selected and recommended by the *Local Planning Team* to the Yukon Government for approval. Following this approval, the *Local Planning Team* in consultation with the public will design and recommend the *Final Boundaries* of the protected area for review and approval by the Yukon Government. The YPAS Secretariat will provide technical support to the *Local Planning Team* and coordinate through a technical interdepartmental working group the territorial government's input to the three stages of the planning process.

2.2 The Extent of Natural Value Assessments

The Strategy recognizes that each protected areas proposal will have a unique set of social, economic and environmental concerns and that accordingly all value assessments will not necessarily be conducted to the same level of detail. The type and detail of resource information will depend on the competing interests and the availability of data. The Strategy also provides for streamlining to allow for a quicker process when inter-governmental and broad public support exists.

Therefore, the natural values criteria and assessment guidelines described in this paper generally will be considered at increasing levels of detail for each of the three planning phases:

1.	Identifying *Areas of Interest*	1:1,000,000-1:250,000 scale*
2.	Selecting *Study Area*	1:500,000-1:250,000 scale*
3.	Designing *Final Boundaries*	1:250,000- 1:50,000 scale*

(* These scales will vary as a function of data availability, resources available to collect and analyze data and according to planning needs and overlapping resource values.)

3.0 SPECIFIC CONTEXT

3.1 Three Main Criteria

The Yukon Protected Areas Strategy defines the three main criteria that must be used when considering natural values assessment:

- **Representativeness**: Core Goal 1 Protected Areas should attempt to capture the full range of ecosystem types that are present in the ecoregion. In some cases, core areas will be shaped by the need to represent large-scale wilderness ecosystems.

- **Ecological Viability:** Core Goal 1 Protected Areas should be able to sustain the natural functioning and evolution of ecosystems on a long-term scale.

- **Naturalness:** Core Goal 1 Protected Areas should be in a largely natural state with few human-caused disturbances.

  (Although not addressed in this summary, a fourth criteria, *research and education*, is also identified in the Strategy to help select protected areas.)

Generally, the criteria and guidelines being used in the Yukon reflect the approaches used by Canada, the provinces and other territories and are supported by national and local conservation groups. All these jurisdictions use at various scales a natural regions framework (as described below) to plan for representation, and, to different degrees, include ecological integrity or viability in their respective planning processes. For instance, Parks Canada uses a classification system of 39 regions for all of Canada whereas British Columbia plans at a considerably more refined scale which considers 100 regions. In contrast, the Yukon, using a classification system of 23 ecoregions, plans to a scale somewhere between these two jurisdictions.

3.2 Tools for Natural Values Assessment

Three groups of tools are available to assess the natural values criteria of potential protected areas and will be used in the various planning stages described in the previous section:

Geographic Information Systems (GIS): The Yukon Protected Areas Secretariat conducts GIS analysis "in-house" as well as works with contracted experts. Key considerations for GIS information are data accuracy, appropriate scale and range of data sources (e.g. regional vs. territorial ranges).

Field Research: Field research is a critical component for assessing protected areas as information is collected about the ecosystem range, areas of high biological diversity & ecological function and landscape level corridors. Multi-disciplinary teams with a broad range of scientific expertise conduct the field research.

Scientific & Local/Traditional Knowledge Panels: To identify core protected areas and other special areas for protection, scientists from many different disciplines as well as people with local and traditional knowledge will be brought together to contribute to these assessments. These groups will contribute to the efforts of a *Local Planning Team* by providing expert knowledge of ecosystems, wildlife populations, geology and landscapes, as well as cultural heritage and traditional land use values. The exchange of information among scientists and local experts allows a synthesis that is not possible by any one individual or discipline. These expert panels will advise on applying design criteria for ecological viability such as design framework (e.g. watersheds), size (e.g. fire pattern), and focal species. As well, they will advise on special areas for protection and other key elements (e.g. corridors) of a protected area network. Expert panels will be used at each of the three main levels of planning in the YPAS process.

3.3 Criteria for Assessing Ecoregion Representation

The goal of **representation** is to identify areas within larger regions that reflect the main characteristics of the region. Selected areas should incorporate the essential ecological character and function of the region.

In the Yukon, representation is identified and assessed based on ***ecoregions*** which are areas with shared characteristics such as climatic, topographic, geologic or vegetation conditions, the presence/absence of components such as permafrost or plant species. Ecoregions are part of a larger North American natural regions framework. From the highest to lowest order, this framework includes: Ecozones, Ecoregions, Ecodistrics, Ecosections and Ecoelement.

Selecting areas based on ecoregions ensures an even distribution of landscapes for the protected area network. Twenty-three ecoregions have by defined for the Yukon by the Ecological Stratification Working Group. In the Yukon, the use of ecoregions means that biologically less-known areas are included in the network. As a result, these protected areas will contain the majority of the Territory's biodiversity.

The criteria for representation, the data sources and rational for their use are summarized in the following table:

Table 1: Criteria for Ecoregion Representation

Criteria for Ecoregion Representation	Data Source/Description	Rationale
Basic Landscape Features (e.g. mountain ranges, plains, river systems, etc.)	**National Topographic Series Database** - covers the entire Canadian land mass **Digital Elevation Model** (Renewable Resources Geographic Information Section) -describes the landscape according to elevation. -can generate slope, aspect and elevation **Yukon Hydrology** (NTDB, *Yukon Ecoregions Report*). - describes watersheds, wetlands, lakes and other hydrological features **Glacial Limits Map of Yukon Territory** (Duk-Rodkin, 1999) - covers the entire Yukon showing the direction of glacial flow.	- this information describes the critical land form features which are characteristic of the ecoregion. - the DEM is being developed. - DEM be a key tool for stratifying the landscape. - can be used with other spatial data to produce land cover maps and identify unique habitat. - the range of hydrologic features is a significant ecological variable. - basis for understanding key ecological processes - areas that escaped glacial events can be refugia for plants and animals species.
Geology and Soil Features	**Soil Landscapes of Canada** 1. (Center for Land and Biological Resources Research, Agriculture Canada) - covers the entire Canadian landmass including major soil characteristic, soil development and parent materials **Geological Classification** (from: Bedrock Geology, Gordey and Makepeace, 1999) -describes packages of rocks of similar age and type. -identifies classes of geologic assemblages	- basis for ecoregion boundaries. - used by most other Canadian jurisdictions. - a key criteria to differential landscapes. - when completed, will be the only Yukon-wide geophysical database at this scale - one of the best abiotic databases for gap analysis
Unique Landscape Features (e.g hot springs, canyons, etc.)	**Recreational Features Inventory Database** (Parks and Outdoor Recreation, Renewable Resources) - inventory based on air photos describing key recreational features (hiking trails, lakes, hot springs, canyons, etc.)	- useful source of interpreted data developed original for the purpose of protected areas planning
Land Cover (vegetation, water bodies, outcrops, etc.) **Land Cover** (cont.)	**CCRS Land Cover Map** (Canadian Center for Remote Sensing) - covers the entire Canadian landmass **Forest Inventory** (Yukon Forest reconnaissance inventory, Bonnor and Oswald, 1985) - air photo interpretation of forest types. -lists leading and secondary tree species, average age and height **Ecological Stratification Database** (in development by Ecosystem Classification Technical Committee)	- vegetation communities are basic structural components of ecosystem. - useful for regional gap analysis but too coarse for boundary determination. - the forest cover inventory is only digital data source of continuous vegetation cover. - can be used to identify limited habitat types -basic tool to assess representation

	-detailed description of land cover.	
Biological Communities (wildlife, fish, plants, etc.)	**Yukon Key Area Database** (Department of Renewable Resources) - describes portion of habitat critical to species survival **Birds of the Yukon Database** (Canadian Wildlife Service) - comprehensive database of sighting and breeding records **Regional Wildlife Management Plans** (Renewable Resource) - summaries information on wildlife communities **Regional Habitat and Wildlife Communities Survey Data** (LaBiche/Beaver Technical Group) - published source of data **Conservation Data Center** - being established with Environment Canada to monitor and track species at risk. **Fisheries Information Summary System** (Fisheries and Oceans Canada) - summarizes existing information and provides references.	- primary source for characteristic species of ecoregions. - basis for focal species analysis. - valuable database to describe avian communities -where completed these plans are a useful summary to help characterize regional biological communities -when available useful source of regional data often specific to watersheds - when completed will be a primary source of data on rare and endangered species. - provides summary information on aquatic species distribution and use of habitats, and identifies base documents.
Rare and/or Vulnerable Ecosystems (sensitive habitats, rare or endangered species, etc.)	**Air photo Interpretation** (various government sources, 1:50,000 scale) - basis for delineating habitats **Yukon Wetlands Map** (Yukon Wetlands Technical Committee, 1999) - digital map of key wetlands **Ecological Stratification Database** (in development by Ecosystem Classification Technical Committee) -detailed description of land cover **Regional Habitat and Wildlife Communities Survey Data** (LaBiche/Beaver Technical Group) - published source of data **Conservation Data Center** - being established with Environment Canada to monitor and track species at risk.	- not complete Yukon coverage - reliable means to map rare or limited habitats at finer scale - generally productive areas which are sensitive, limited in area and support high biodiversity - basic tool to assess representation - when available useful source of regional data often specific to watersheds - rare and species at risk are important factors when identifying sensitive habitats.
Ecological Diversity (diversity between ecosystem rather than species richness)	**Ecological Stratification Database** (in development by Ecosystem Classification Technical Committee) -detailed description of land cover	-basic tool to assess diversity of ecological assemblages on the landscape

3.4 Criteria for Assessing Ecological Viability

The conservation biology literature defines ***ecological viability*** as the ability of ecosystems, species and populations to be sustained and allowed to evolve naturally. Furthermore viability depends on how intact an ecosystem is and whether or not the ecological relationships within the ecosystem can be maintained. Over the last decade advances have been made in the field of

conservation biology in understanding the relationship between landform (i.e. ecoregion representation) and ecological processes (i.e. ecological viability):

> *Protected areas planning must consider that patterns of biodiversity are influenced by varying spatial and temporal scales of physical events. Planning for core protected areas that effectively contribute to ecological representation requires consideration of important disturbance-recovery cycles that influence community dynamics. A system of protected areas should form a network of sites that, when linked, ensure evolutionary processes continue over the long term (decades to millennia). Planning across these scales is required in order to accommodate environmental change with no net loss of biodiversity.* [1]

More specifically, YPAS Technical Paper No.2 (*Types of Protected Areas and Criteria for Selection*) indicates that to maintain ecological viability, representative Core Goal 1 Protected Areas should:

1. Be large enough to preserve the interrelationships among ecosystem elements and ensure the long-term survival of flora and fauna species;
2. Be large enough to allow for the survival and recovery of ecological functions following natural disturbances;
3. Include transitional or edge habitats where two or more habitat types meet;
4. Connect with important habitat links such as rivers, valleys, wildlife trails and migration routes; and
5. Be free of barriers to movement of wildlife.

While the eco-region, given the similarity of features, is a useful basis to assess representation, identifying *areas of interest* from an ecological viability perspective may involve more than one ecoregion. This is due to the linkages between adjacent ecoregions in supporting critical habitats and ecological relationships. A useful example is the role that the southwest British Richardson Mountains play in the important ecological function of recharging the Whitefish wetlands. Each of these areas are in two different but adjacent ecoregions.

More recently, the conservation biology literature[2] identifies three main categories of criteria that can be used to define ecological viability:

1. area/size,
2. shape/configuration and
3. connectivity/linkages.

These criteria recognize that spatial scale is an important planning consideration to allow for the inclusion of minimum areas for large mammalian species habitat (i.e. grizzly bear habitat requirements).

---

[1] Kavanagh, K and Iacobelli, T, 1993, A Protected Areas Gap Analysis Methodology□ Planning for the Conservation of Biodiversity□ and Salwasser, H, 1991, In Search of a Eco□Systems Approach to Endangered Species Conservation, p. 18.

[2] Nudds, T. et al, 1998, "Protected area networks: assessment of Ontario's "Nature Best" action plan and recommendations," in *Parks and Protected Areas Research in Ontario*, pp. 363-374.

Table 2: Area/Size Criteria for Assessing Ecological Viability

Area/Size Criteria	Description	Rationale
Focal Species (Minimum Critical Area)*	-defines various types of focal species (umbrella, keystone, indicator). -aimed at preserving a single species with the largest requirement for minimum are viability	-focal species have the largest spatial needs. Other species will be protected through the protected areas for these species.
Fire Disturbance (Minimum Dynamic Area)*	-mapping of Yukon forest fires since the 1950's.	-Minimum Dynamic Area is the smallest area that contains the range of habitats and is able to re-colonize following a burn.
Minimum Reserve Area (Nudds et. al. 1998)*	-defines a minimum reserve area that above which species richness is not distinguishable from non-fragmented habitat of the same size. (approx.5,000 sq. km benchmark)	-MRA provides a test to assess if a proposed protected area will maintain ecological viability.

* (Combined with other variables related to assessing ecological viability, area criteria provides a useful benchmark against which to test and verify proposed *areas of interest, study areas and boundaries.* Other resource value assessments will also play role in defining the size, shape and location of protected areas.)

Table 3: Shape/Configuration & Connectivity/Linkages Criteria for Assessing Ecological Viability

Shape/Configuration Criteria	Description	Rationale
Watershed *	-watersheds typically define the outer extent of the elements and inter-relations that make up an ecosystem -the National Topographic Database and DIAND Forest Resources watershed database provide baseline information.	- watersheds are generally an all inclusive means to define a viable ecoregion - more specifically, water quality is critical to the viability of an ecosystem.
Shape Analysis*	- this analysis assesses the shape of a proposed protected area in terms the ratio of its area to the overall circumference (rounder is better than longer) - GIS calculates the area and perimeter of protected area options	- the area to circumference ratio indicates the degree to which potential outside influences can impact a protected area (ie. introduced exotic species, vulnerability to disturbances, etc.) - this analysis aims to minimize the edge effect and is scale and terrain dependent.
Key Habitat and Biological Communities*	-defines that portion of habitat used by a species critical for its survival. - available through the Department of Renewable Resources GIS database	-ensures that critical wildlife populations and habitat are included.

* (As in the case of area/size criteria, shape/configuration and connectivity/linkages provide for a suite of criteria to consider when assessing ecological viability. Used together these criteria provide a benchmark against which to assess and test proposed protected areas.)

3.5 Criteria for Assessing Naturalness

Naturalness is described in the YPAS Technical Paper No.2: "areas of interest for ecoregion representation should have experienced a minimal degree of development and human caused disturbance." Naturalness can be assessed by examining existing and potential disturbances, settlements or land developments, surface disturbances and existing land tenures. An assessment of naturalness is an indicator of the health of ecological function and the long-term ecological viability of protected areas. This definition is consistent with the notion of wilderness as described in the *Yukon Wilderness Act (1991)*: ". . . ecosystem processes largely unaltered by human activity or human activities that do not significantly modify the environment."

There are five criteria used for assessing naturalness.

Table 4: Criteria for Assessing Naturalness

Criteria For Naturalness	Description	Rationale
Linear and Point Source Disturbance Density	-this analysis would provide data on linear and point source disturbances including site developments, mines, roads, seismic lines and transmission lines. - this data is available through the National Topographic Database, Indian and Northern Affairs Canada and Community and Transportation Services.	- this analysis is a standard tool for assessing naturalness. -linear disturbances can create negative impacts through habitat fragmentation, creation of edge habitats and provision of access. - information on mineral, oil and gas exploration and forestry, tourism and municipal activity describes the source of these potential disturbances.
Introduced Species	- this information provides a measure of the degree to which the endemic species of a certain area are under threat by introduced species. - data on introduced vascular plants has been collected by botanists for the Yukon.	-the absolute number of introduced species relative to the ecoregion as a whole is an effective indicator of naturalness.
Connection to other critical ecological functions or to other protected areas	- includes critical movement or migration corridors to allow for species to use different areas for different ecological functions (seasonal feeding, rutting, birthing, etc.).	-areas would connect through rivers, valleys, and wildlife trails and migration routes.
Adjacent Land Use	- adjacent uses consider resource development activities adjacent to a protected area. - this data is available through the National Topographic Database, Indian and Northern Affairs Canada and Community and Transportation Services.	- barriers that prevent wildlife movement or adjacent activities that could impact a protected area are critical design features. - the role of potential buffer areas around protected area through potential Goal 2 designation is a potential option in designing a protected area.

4.0 RESULTS

The information and analyses resulting from the assessment of representation, ecological viability and naturalness criteria will be issued in reports containing comprehensive value statements and annotated maps (with rankings where possible) for each protected area proposal. As described in section II, the expert scientific and local/traditional knowledge panel and the Local Planning Team play a critical role in defining and recommending the location, size and shape of protected areas. This will be done throughout the three main stages of planning: identifying *Areas of Interest*, selecting a *Study Area* and designing *Final Boundaries.* These reports will include descriptive interpretations of non-quantified values as well as qualitative summaries (e.g. low to high) in tabular, graphic and photographic formats.

Accounting for all these criteria will be a challenge. Depending on the data and information available, budgets to undertake research and other overlapping resource uses, not all of these criteria will be necessarily incorporated into all assessments.

In an effort to summarize generally how these criteria will be considered and integrated two simple tables has been developed:

Table 5: Summary Table for Ecoregion Representation Criteria

Representation Criteria	Candidate A	Candidate B	Candidate C
Basic Landscape Features			
Geology and Soil			
Unique Landscape Features			
Land Cover			
Biological Community Characterization			
Rare and/or Vulnerable Ecosystems			
Diversity and Richness			

Table 6: Summary Table of Ecological Viability and Naturalness Criteria

Ecological Viability & Naturalness Criteria		Candidate A	Candidate B	Candidate C
Area /Size	Focal Species			
	Fire Disturbance			
	Minimum Reserve Area			
Shape / Configuration	Watersheds			
	Shape Analysis			
	Key Habitat			
Adjacent Land Uses				
Connectivity /Linkages	Functional Connectivity			
Naturalness	Linear Disturbance Density			
	Point Source Disturbance			
	Introduced Species			

Appendix 2.2: Forest Resources Assessment Summary Report

Prepared by: Indian and Northern Affairs, Canada, October 2000

1.0 INTRODUCTION

The forests of the Yukon provide the forest resource sector with a number of commercial products including building logs, saw logs, firewood and fence materials. Forest Resources ensures that the sustainable development of Yukon timber resources and the provision of efficient, reliable, timber supplies to industry occurs within a policy, administrative and regulatory framework that benefits and fosters growth in the forest industry for the social and economic benefit of the Yukon.

1.1 Purpose of the Paper

The purpose of this paper is to outline the input that Forest Resources, DIAND can contribute to the three critical Yukon Protected Areas Strategy (YPAS) Planning Steps.

The three YPAS Planning Steps are:

Step 1. Identify areas of interest.
Step 3. Select study areas.
Step 5. Design final boundaries.

1.2 Scope and Limitations

Forest Resources will provide a ranking of forest values to help assess potential impacts of protected areas on the forest resource sector.

The Forest Resources ***geographic information system*** (GIS) and data archive is the source of data for input for YPAS planning. The data archive system is based on the National Topographic Series which includes **planimetry** (the physical features on a map such as rivers, lakes, roads, settlements, shore lines, etc.) and digital elevation data. The major limitation to the data sets at this time is the incomplete forest inventory coverage of the forested area of the Yukon. To date, only the southern third of the Yukon has been inventoried.

2.0 YPAS CONTEXT

The Forest Resources data sets fit into the YPAS planning steps as follows:

Step 1. Identify Areas of Interest. Assessments at this broad scale will help to identify areas of high resource values to be avoided when identifying initial areas of interest for protection. The *Reconnaissance Inventory*, the *Forest Inventory* and any supplemental reconnaissance information provide information for broad planning purposes at the territorial level and therefore is best suited to the task of identifying areas of interest.

Step 3. Identify Study Areas. Forest assessments at this stage will be used to compare areas of

interest and identify study areas that avoid potential conflict where possible. At this step the stand level *Forest Inventory* and any reconnaissance information should be used where available (between 60 degrees and 62 degrees north).

The full *Vegetation Inventory* when completed will replace the current *Forest Inventory* and will provide coverage from 60 degrees to 65 degrees north and Old Crow.

Step 5. Design Final Boundaries. More detailed assessments will be used to assist in identifying specific areas of potential conflict to be avoided if possible when drawing final boundaries. Additional field work may be required at this stage.

3.0 FORESTRY CONTEXT

3.1 Tools

The GIS contains two forest inventories, the *Reconnaissance Inventory* and the *Forest Inventory*. A brief description of the two inventories follows:

1. **The Reconnaissance Inventory** The reconnaissance inventory was completed in 1985. This inventory of the Yukon Territory is an extensive forest inventory for broad planning purposes at the territorial level. Land classes and major forest types are mapped and estimates of area, volume and biomass were developed for forest land. The inventory is not intended to provide enough detail or to be sufficiently accurate to make decisions on specific sites. The reconnaissance inventory is best shown at a map scale of 1:125,000 or smaller.

2. **The Forest Inventory** Since 1985 a more detailed forest inventory has been completed between latitudes 60 degrees and 62 degrees north (Yukon/BC border north to **Carmacks). This inventory identifies individual forest ploygons and provides information on species, height, crown closure, age, site class and disturbance history. This inventory is typically shown at map scale of 1:50,000. When available, this – rather than the reconnaissance inventory – will be used**

A full vegetation inventory between 60 degrees and 65 degrees north and the Old Crow area has been approved. It is planned to complete this new inventory by the end of 2001/02. The vegetation inventory includes a hierarchical land cover classification as well as the same type of forest polygon information included in the older forest inventory. This inventory is typically shown at a map scale of 1:50,000.

There are two other coverages. Watershed boundaries have been delineated up to 62 degrees north and a 50 year fire history coverage exists for all of the Yukon. The two forest inventories, together with the watershed and fire history coverages provide the basis for GIS analysis. This analysis includes insect attack information, priority harvesting zones and new roads, built since the last inventory.

An important tool that will be used to analyse the impact on the forest sector of area deductions,

is ***timber supply analysis*** (TSA) modelling. The TSA uses the data in the GIS and its inventory coverages coupled with management and growth assumptions to forecast timber supply over a specified time period.

3.2 Criteria to Assess Values

There are a number of criteria in the coverages in the GIS, and criteria that can be derived through modelling, that will be used to evaluate resource potential.

These criteria include:

- impact of area deletion on the timber supply analysis (TSA) harvest ceiling for forest management unit
- access
- distance from manufacturing centre
- topography
- site productivity
- volume of timber per hectare
- species composition

These values may be important today (for example, an area with high timber volume) or may be important in the future (for example, a highly productive site that may not have timber due to a fire).

3.2 Time and Costs

Turnaround time for GIS analysis can be between one day to two weeks depending on the amount of programming required. It is unlikely there will be costs outside the GIS analyst's time. In addition, social and economic impacts for affected communities must be included in the analysis.

Step 5. may require more detailed field assessments. Field assessments typically take a field season (May to September) to complete and would be carried out under contract. Costs will depend on work to be done.

A timber supply analysis would be contracted and usually is completed in one month.

4.0 RESULTS

4.1 Rankings

Rankings will be applied to values being assessed. An example of rankings assigned to resource values is high, medium, low and nil values.

4.2 Reports

The results of GIS analysis are well suited to map presentation where the ranking of values can be shown in different colours.

A timber supply analysis is a written report with tabular summaries and various thematic maps.

How Forest Resources Assessments Apply to YPAS

	YPAS Steps		
Value	**Step 1. Identify Areas of Interest**	**Step 3. Select Study Area**	**Step 5. Design Final Boundaries**
Forestry	Reconnaissance Inventory	- Reconnaissance Inventory north of 62 degrees, - Forest Inventory south of 62 degrees, - New Vegetation Inventory, 60 to 65 degrees north and Old Crow when completed (year 2002). - Timber Supply Analysis	- Forest or Vegetation Inventory - Additional field work as required

appendix 2.3: Cultural/Heritage Resources Assessment summary

Prepared by: Heritage Branch, Tourism Yukon, September 2000

1.0 INTRODUCTION

The legacy to be preserved by Protected Areas is not alone the natural environment and wildlife, but the history that is in the landscape that has for many millennia been the homeland of Yukon's First Nations and those who followed them.

Heritage resources include the sites, buildings and objects that are the product of human art, workmanship, or use, and including plant and animal remains that have been modified by or deposited in consequence of human activities. Heritage resources include as well palaeontological objects, which are the remains that indicate the existence of extinct or prehistoric plants or animals.

This paper outlines how heritage assessments are prepared for YPAS protected areas planning.

The main limitation to heritage assessments is the extent to which information on heritage is available for some areas of the Yukon.

2.0 YPAS CONTEXT

Heritage values are an important consideration early in the YPAS process since they are important to the First Nations within whose Traditional Territory protected areas planning takes place. The review of heritage values takes place at three steps in the process.

Step 1: Identify areas of interest. Following the selection of the priority *ecoregion(s)*, available information on archaeological, historical and palaeontological resources is assembled at a regional scale to assist in the identification of *areas of interest*. The Yukon Heritage Branch maintains records and maps of known sites.

Step 3: Select Study Area(s). Once an *area of interest* and *study area* are identified, oral history and field research are usually required to provide progressively more detailed assessment of heritage values for an area.

Step 5: Design Final Boundaries. This information may assist the Local Planning Team in recommending final boundaries for a protected area.

3.0 HERITAGE CONTEXT

The history of the Yukon is embedded in its landscapes. In the northern Yukon, the rounded hills and lake-dotted basins are the remnants of Ice Age Beringia; caves in the limestones of the Ogilvie Mountains preserve frozen traces of ancient hunts and long extinct animals; the remains of upland hunting sites are visible as scatters of stone tools and debris on bare ridges; fish camps are deeply buried in the silty banks of rivers and lakes; old trapping cabins and caches are hidden deep in the wooded valleys; and sediments preserve the fossils that shed light on still more

ancient environments, some predating the very landscape we see today.
In the landscapes of the Yukon are also the places of legend: Crow's unsuccessful attempt at making a fish trap is preserved in the rocks at Five Finger Rapids; a large cave in Eagle's Nest Bluff is the home of a terrifying creature like a giant frog; and the rocks of Bear Cave Mountain are still stained red with blood where Willow Man of Gwitchin legend leapt to his death.

4.0 CRITERIA

4.1 Representative

For the Protected Area to be meaningful in terms of its human history it must include sites that represent all periods of the past and the full range of activities that once took place in the region, including hunting sites, fishing villages, lookouts sites, rendezvous sites, caribou surrounds, stone quarries etc. Representative palaeontological resources and geoscapes should be considered in protected area planning as well.

4.2 Significant

Site significance is assigned by archaeologists based on factors of site uniqueness, size, complexity, antiquity, or the degree of preservation of structures or material remains. Qualities of uniqueness, antiquity and preservation are used by palaeontologists to assign significance to fossil resources as well.

The archaeological and palaeontological record of unglaciated central and northern Yukon is one of the most significant chapters of Yukon's past, relating to the early human and animal colonization of North America through Eastern Beringia. This Beringian history of the Yukon is documented only in a very preliminary fashion at present.

Significant in the history of First Nations and Yukon communities are places which are highly valued for their connection to people living today, such as Fort Selkirk and Rampart House. As well, places which have legendary importance or which play a role in the stories of Crow or of the mythical heroes Beaver Man or the Traveller have become landmarks to First Nations of their history in the landscape.

5.0 METHODS AND TOOLS

5.1 Assembling Existing Information

In consultation with the First Nations whose traditional territories are affected, traditional use sites, resources areas and trails are mapped for the study area as this information is available. First Nations place names also preserve the knowledge and history of the landscape.

Areas of archaeological potential are identified from existing databases, from traditional land use information and from patterns of archaeological site distribution documented elsewhere in the Yukon. The relationship of sites of human habitation and activity to former landscapes (as interpreted from surfical geology and landform mapping), must be considered as well: ancient beaches and terraces of

glacial lakes or former stream and outwash channels are areas of potential for the discovery of older archaeological sites.

Areas of palaeontological potential are determined from existing databases and from the regional geology.

5.2 Filling in the Information Gaps – Heritage Resource Inventory & Oral History Research

Many areas of the Yukon have never been explored for archaeological, historic, or palaeontological sites. Baseline inventory work in partnership with the affected First Nations would be required where little information exists on traditional use sites. Inventory would entail both field surveys by archaeologists and First Nations, and oral history work in the community to obtain information on traditional history, including traditional sites, resources areas, trails and place names. Palaeontological investigations of key localities may be undertaken as well.

The completeness of the existing record and accessibility of the study area will be the principal factors affecting cost of the heritage resource inventory as part of the YPAS process. YPAS will be expected to undertake support of field inventories, consultant fees, elders' and researchers' honoraria, and report preparation. The Government of Yukon Heritage Branch will undertake to identify and summarize existing information of the history, archaeology and palaeontology of the study area in cooperation with the First Nations, and assist in developing recommendations for the scope of further work. Heritage Branch will also assist in summarizing heritage values for the study area.

5.3 Assessing Significance

The significance of heritage resources is defined in consultation with First Nations, the community, government agencies and scientists.

6.0 RESULTS

- Heritage Maps
- Regional History

Note: Information on the location of archaeological and palaeontological sites is not to be released publicly due to the vulnerability of these resources to looting. Reports and maps including this information may be used for planning purposes only.

As part of the product of the heritage inventory work, maps showing the location of known heritage resources. Based on patterns of traditional land use, the location of trails, and archaeological site distribution, areas of high potential for heritage sites are identified as well, to assist in developing a picture of the history of the region in terms of the study area geography.

Mapping of regional geology will assist in predicting areas of palaeontological potential.

It should be stressed that concentrations of sites are not the sole indicator of the heritage significance of a geographic locality. Legendary landscape features, for example, may occur in

isolation from resource areas but can be highly significant in the culture of First Nations.

6.1 Constraints Affecting the Interpretation of Archaeological Site Distribution and the Definition of Heritage Values in the Landscape

Frequently, the distribution of known archaeological sites is a factor of sampling (where surveys have been made) and of ***archaeological visibility***. Most sites are presently documented along roads and trails, and water bodies near populated areas of the Yukon as a factor of where people have looked, rather than a factor of the actual distribution of past occupation sites.

Archaeological visibility refers to preservation and accessibility of archaeological sites. Sites in alpine or high latitude regions are frequently exposed (not buried by soils) and can be discovered in brief ground inspections of the locality. On the other hand, sites in heavily wooded areas, such as southeast Yukon, require more time to locate as subsurface testing is required. Archaeological visibility refers also to the differential preservation of sites. Sites along rivers, for example, are vulnerable to loss as a result of bank erosion. Apparent differences in the number and distribution of archaeological sites may be due to visibility, rather than due to actual differences in past occupancy or population density.

How Heritage Assessments Apply to YPAS

Value	YPAS Steps		
	Step 1: Identify Areas of Interest	**Step 3: Select Study Area(s)**	**Step 5: Design Final Boundaries**
Cultural / Heritage	Assemble available information on archaeological, palaeontological and historical resources at a regional scale to help identify ***areas of interest.*** The Yukon Heritage Branch maintains records and maps of known sites. The significance of heritage resources is defined in consultation with First Nations, the community, government agencies and scientists.	Once ***study area(s)*** are identified, oral history and field research are usually required to provide a progressively more detailed assessment of heritage values for an area.	More detailed information may assist the Local Planning Team in recommending final boundaries for a protected area.

appendix 2.4: Mineral Resources Assessment Summary

Prepared by: Mineral Resources Branch, Economic Development, Yukon, October 2000

1. INTRODUCTION

The assessment of resource values has become an important government responsibility as communities of every scale face the challenges of balancing environmental goals with responsible development initiatives. In the Yukon, land is coming under increasing pressure from competing and commonly conflicting interests.

Mineral Resource Assessments (also known as MRAs) offer a valuable tool in any comprehensive land use planning process by providing a scientific perspective on mineral potential. The purpose of Mineral Resource Assessments is to estimate the relative mineral potential of an area before making land use decisions that might affect the amount and type of activity permitted in that area. Incorporating essential information on mineral resources into a multi-disciplinary approach contributes to informed and balanced decision making. Potential conflict may be avoided and conservation objectives may be met while still preserving access to resources.

This paper summarizes the methodology for mineral resource assessments as used in the process outlined in the Yukon Protected Area Strategy. A detailed description of the methodology is outlined in the technical paper.

2. YPAS CONTEXT

In the Yukon Protected Areas Strategy (1999), the Yukon Government committed to avoiding areas of high mineral potential and development activity while setting up protected areas (where reasonable options exist); and to carrying out Mineral Resource Assessments at a reasonable level of detail and within a prudent time frame. YPAS commits the Yukon Government to carrying out Mineral Resource Assessments at regional (YPAS Step 1) and detailed (YPAS Steps 3 and 5) scales.

3. DESCRIPTION

Definition: ***Mineral Resource Assessments*** are an evaluation of the potential of a given area to host mineral deposits. These assessments are based on the compilation of the best available regional and local geology maps, geochemical and geophysical surveys, known mineral occurrences for the area and the current state of knowledge on mineral deposits. If needed, new surveys are conducted to expand the database. A panel of experts estimates the relative mineral potential of different tracts of land, based on known favourable characteristics of individual deposit types. A mineral potential map displays the results of the assessment by showing the relative mineral potential of different parts of an area under study. Results and the methodology of the assessments are publicly distributed as Open File reports after final land designation.

Limitations - Mineral assessments are based on the best geoscientific information available at the time of the study. Assessments must be revised with updates to the database and advances and discoveries in geology, mineral deposit models, metallogeny, etc. This type of study represents a "best estimate at the time" on a resource that is hidden in the ground and cannot be quantified with absolute certainty. Conclusions derived from such a study are only as sound as the data that are available for the evaluation.

3.0 METHODOLOGY

The methodology used to conduct mineral assessments is modeled after those used by the British Columbia Geological Survey and United States Geological Survey. It is used for metallic and industrial minerals, placer deposits and coal. Assessments for oil and gas deposits are done separately using a methodology developed by the National Energy Board.

Two different phases of assessment are required under the Yukon Protected Areas Strategy and a third phase may be required to finalize boundaries.

Step 1. First, a regional-scale assessment is used to help identify initial areas of interest for protected areas planning .

Steps 3 & 5 Once one or more specific areas of interest have been selected, a detailed mineral assessment of the area, with fieldwork if needed, is conducted at a more detailed scale than the regional-scale assessment.

Step 5. A third, more detailed phase may be required to resolve specific final boundary concerns.

The methodology is similar for the regional and detailed assessments, up until the final assessment stage. Both consist of:

- digital data compilation of available geoscientific data and pertinent mineral deposit models,
- identification of gaps in the geoscientific database,
- additional fieldwork (if necessary and if possible),
- final compilation, and
- tract definition (the area under study is divided into areas of similar geology called ***tracts***.)

Tract definition is followed by an assessment stage conducted by an expert panel of industry and government geologists (also called estimators). The tracts are evaluated individually for their potential to host different types of mineral deposits. Criteria used to determine the potential of tracts to host such deposits vary depending on the type of deposit. The criteria that are used in Yukon MRAs come directly from mineral deposit models developed by the British Columbia Geological Survey and the US Geological Survey.

Estimates are based on the available geoscientific data which include:

- geological maps,
- Yukon Minfile (an inventory of all known mineral occurrences),
- regional stream sediment geochemical surveys (RGS) which help outline background

and anomalous metal content of the rocks,
- regional airborne geophysical surveys and
- private assessment reports.

The final assessment stage differs depending on the scale of the assessment. For the regional-scale assessment (supporting YPAS Step 1), the expert panel estimates the probability of finding undiscovered mineral deposits in each geological tract. Their estimates are then digitized and tabulated using the Monte Carlo simulator program that converts the experts' estimation into probability graphs. The program then combines the estimates with known grade and tonnage data to predict the amount of each commodity that is estimated for each tract. This is used as a means to compare one tract to another.

For a detailed assessment (supporting YPAS Steps 3 and 5), the estimators rank the tracts with respect to one another, without the probabilistic estimation.

Additional information may be required (YPAS Step 5) in areas of potential resource use conflict or where stakeholders require greater detail to establish acceptable protected area boundaries.

The final product is an overall relative ranking of the tracts, from highest to lowest, displayed as a mineral potential map.

4. CONCLUSIONS

Mineral potential maps provide a comparative ranking of an area that reflects current thinking on geological potential. Assessments are based on the known resources of the area and on the ability of experts to estimate the potential of specific rock packages to host undiscovered mineral deposits. The results of the assessments are presented as maps showing the relative ranking of the potential of different groups of rocks to host specific types of mineral deposits.

The quality of the final product is dependent on the quality and completeness of the database, on access to experts with experience with the geology and types of mineral deposits to be found in the area under study as well as on having an adequate time frame for the assessment process.

The Yukon government Mineral Resource Assessment is a sound, scientifically rigorous and reproducible method that supports the land-use planning process by providing decision-makers with factual information on existing and potential mineral resources. The Department of Economic Development makes use of regional and site-specific MRAs in support of the YPAS commitment to avoid areas of high mineral potential where reasonable options exists. The same process is recognized and used in other jurisdictions to assist land-use planning.

How Mineral Assessments Apply to YPAS

Value/Resource	YPAS Steps		
	Step #1 Identify areas of interest	**Step #3 Select study area(s)**	**Step #5 Design Final Boundaries**
Minerals	Regional Mineral Resource Assessment	Detailed Mineral Resource Assessment	The results of the detailed assessment plus additional more detailed information/fieldwork as required
Time and resources required (in house and consultant costs at current values)	GIS support. Minimum per assessment: 1. Assessment panel cost: 2. $16,000-30,000. Time: 6-7 winter months.	GIS support. Minimum additional information: 1. Assessment panel cost: $8,000-10,000. 2. Time: 7-20 months, depending on existence of RGS (regional stream sediment geochemical survey) data. 3. Field work cost: up to $150,000 (for a full season) 4. RGS survey cost: $200,000-750,000/map sheet.	GIS support Additional field work if necessary

appendix 2.5: Oil and Gas Resources Assessment Summary

Prepared by: Oil and Gas Resources Branch, Economic Development, Yukon, October 2000

1.0 INTRODUCTION

The Yukon Protected Areas Strategy (YPAS) outlines the need for resource assessments to be used to avoid conflicts between protected areas and other resource uses. Petroleum resource assessments conducted by the Oil and Gas Resources Branch are based on statistical methodology developed by scientists with the Geological Survey of Canada and the National Energy Board. The assessments are credible, scientific and economically unbiased. The process is accepted in Canada by both governments and industry as appropriate for relatively unexplored oil and gas regions such as those found in Yukon.

Yukon's oil and gas basins have experienced limited oil and gas activity compared to the rest of North America and as a result, the geological data available to determine oil and gas potential in Yukon is also limited. The oil and gas basins of the territory are considered by industry to be immature with respect to petroleum exploration and development. As of September 2000, only 71 wells have been drilled and all were completed between 1957 and 1991. Other data sources for this time period include various geological and geophysical surveys that differ in scope and quality of preservation or accessibility.

As the oil and gas industry develops in Yukon and new data is generated, it is anticipated that the resource assessment process will change to reflect a more mature level of exploration in the basins of Yukon. The collection of new data has been, to date, industry driven and is largely dependent on the level of oil and gas activity in the territory. New information obtained from current geoscience exploration is now becoming available for use in petroleum assessments. The use of this information will ensure potential resource estimates reflect the best available knowledge.

2.0 PETROLEUM RESOURCE ASSESSMENTS

Petroleum resource assessments are used in three of the eleven stages of the YPAS process:

- Step 1: Identify Areas of Interest
- Step 3: Select a Study Area
- Step 5: Design Final Boundaries of a Protected Area.

Step One: Oil and gas resource assessments are used to identify areas of potential petroleum resource values. Regional or basin scale resource assessments are used at this stage.

There are eight regions or basins with oil and gas potential in Yukon (Figure 1). In anticipation of protected areas planning, regional petroleum assessments are initiated by the Oil and Gas Resources Branch. These assessments are based on nationally recognized procedures used by the Geological Survey of Canada (PETRIMES) and National Energy Board (@RISK) to estimate

Figure 1. The areas or basins of oil and gas potential in Yukon. Six of the regions have completed basin-scale assessments as of November, 2000. The Old Crow an l North Coast regional assessments have not yet been initiated.

resource potential in similarly unexplored regions of Canada. The methodologies only estimate the statistical distribution for various geological parameters and are economically unbiased.

Assessments are in report form and include:

- a geological compilation of the area,
- the identification of potential oil and gas plays,
- statistical analysis involving frequency distribution and probability of occurrence and
- the generation of basin-scale maps to outline identified plays (1:1,250,000 or smaller).

The oil and gas potential for a region is subsequently mapped using a relative ranking based on estimates of oil and gas volume. In some areas, the plays overlap and the cumulative volume is used to assign a rank to the oil and gas potential. These maps are used to distinguish areas of strong hydrocarbon potential so that, if possible, alternative protected areas can be identified.

Step Three: Additional information may be required to provide a greater level of certainty for the different plays. Detailed geological mapping or other geoscientific investigations such as test holes or geophysical surveys could be initiated to further refine the available information or to fill data gaps. The areal extents and relative rankings of plays are then mapped at larger scale (for

example 1:125,000) than the regional assessments (Figure 2). Consultations with geological experts are undertaken to ensure the oil and gas potential map represents the most current understanding of the area.

Other issues such as access may be considered at this time. These factors do not affect the relative rankings for the petroleum assessment. However, they are key to the ability of a company to develop a resource and therefore must be taken into account when identifying a potential study area.

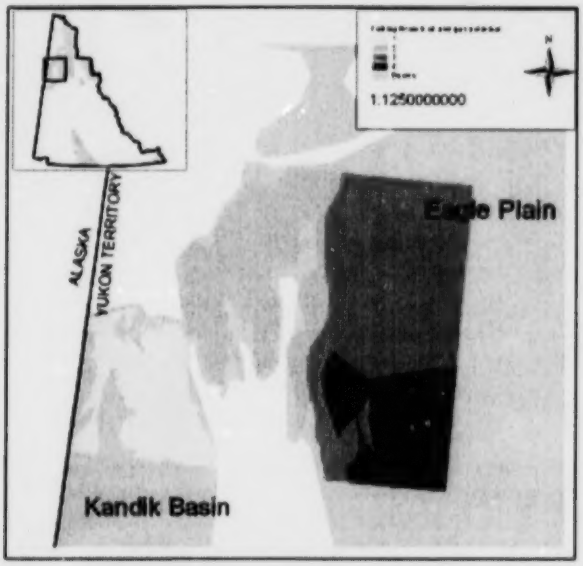


Figure 2. An example of a map with relative ranks of oil and gas potential for the Fishing Branch Study Area. Regions of highest to lowest oil and gas potential are indicated.

Step 5: Additional geological studies may be initiated to address specific concerns or opportunities raised during the final planning process. The scale of the additional information would be detailed as required.

3.0 RESOURCES

Advance communication of a potential Protected Areas Strategy initiative is key to enabling the Oil and Gas Resources Branch to be able to fulfill the obligations associated with Step One of the YPAS process. A minimum of six months and $20,000 is required to complete a single regional assessment, when no additional data collection is required. In some areas, regional mapping may be required. This is estimated at approximately two field seasons with a cost of $150,000 per season.

Detailed assessments provide additional certainty to oil and gas plays identified in the regional

assessment. Experts are consulted to verify the results at this level of assessment and transportation costs are estimated at $2000. In some cases, the collection of new information at a larger scale may be necessary. Geological mapping may require up to two field seasons at a cost of $150,000 per season. Test holes, to determine subsurface geology, may be completed at an estimated cost of $150 per metre. Due to the expense of conducting geophysical operations, Oil and Gas Resources Branch has relied on industry to supply most of this information.

As with all scientific analysis, the quality of the assessment is directly related to the quality of available data. The reliability of the data may be assessed before it is used to determine oil and gas potential.

How Oil and Gas Assessments Apply to YPAS

Value/Resource	YPAS Steps		
	Step #1 Identify areas of interest	**Step #3 Select study area**	**Step #5 Design Final Boundaries**
Oil and Gas	Regional Oil & Gas Assessment	Detailed Oil & Gas Assessment	Additional information/fieldwork as required
Time and resources required (in house costs at current values)	GIS support. Minimums per assessment: 1. Cost: $20,000. 2. Time: 6 months. Best estimate for additional information (where possible): 1. Mapping 1:250,000 = $150,000/season for approximately 2 seasons.	GIS support. Minimum additional information: 1. Consultation with experts: $2,000. Best estimate for additional information (where possible): 1. Seismic: $3,200/km^2. 2. Geological mapping at 1:50,000: $150,000 for two seasons 3. Test hole: As required.$150/metre	As required.

4.0 CONCLUSIONS

Regional resource assessments for oil and gas in Yukon are based on scientific methodologies developed by the Geological Survey of Canada and the National Energy Board. These procedures are the same as those used in federal assessments of relatively unexplored areas and are appropriate for use in Canada's north.

All levels of the resource assessments are dependent on availability of quality information. Where the collection of additional data is necessary, funds and time may be the limiting factors affecting the scope of the assessment.

Note: For more detailed information, see the complete technical report from which this summary report was taken. This is available from the Department of Economic Development, Oil and Gas Resources Branch, tel. 667-3427.

Yukon Gov't, Dept. of Economic Development
2000 *Yukon Protected Areas Strategy: Oil and Gas Resource Assessment Process*. 11 p.

appendix 2.6: Recreation Resources Assessment Summary

Prepared by: Yukon Parks & Outdoor Recreation Branch, Renewable Resources, Yukon, August 2000

I. 0 INTRODUCTION

1.1 Purpose of the Paper

The purpose of this paper is to identify and describe the process and criteria for the selection of areas of recreational value for YPAS implementation. This process is commonly referred to as recreation gap analysis.

In the context of YPAS, ***outdoor recreation*** may be defined *as physical activity in an outdoor environment conducted in a sustainable manner.*

To protect outdoor recreation features, we need to both conserve representative areas and provide opportunities for people to appreciate them.

That appreciation may be expressed in a variety of ways, e.g. visiting frontcountry park trails and seeking challenging backcountry wilderness experiences.

1.2 Scope and Limitations of the Paper

The process identifies criteria to systematically analyze gaps in representation of areas of recreational value within the existing system of protected areas. The process reviews recreational values at an ecoregion, "broad initial area of interest" and study area scales. Recreation gap analysis criteria are described as they apply to the steps outlined in the YPAS process. The method of recreation assessment employs the Recreation Features Inventory from 1982. Other assessment techniques are now available and may be used when applicable.

2.0 YPAS CONTEXT

2.1 Where does recreation assessment fit in the YPAS process?

Assessment of recreation opportunities will fit into the YPAS process at several stages. In those ecoregions where there are no protected areas, criteria for selection of study areas may be applied on a "blank map". In areas where protected areas already partially represent an ecoregion the criteria can be applied to better represent the recreational opportunities and values within the system of protected areas. In ecoregions where protected areas fully represent ecoregion values the recreation criteria can identify recreational opportunities, values and features to be forwarded as Goal 2 areas.

It is recognized that the environmental/ecological accounts are the driving force behind the

identification of "broad initial areas of interest", that recreational selection criteria may be applied at a later step.

2.2. Scale and scope of assessments for each relevant YPAS step

"YPAS Technical Paper #3: Planning and Establishing Protected Areas" describes specific steps in identifying future protected areas. Steps 1, 3 and 5 are pertinent to this paper. They are reprinted here incorporating a brief description of the implications for recreation resource criteria and assessment.

Step 1: Identify ecoregions and initial areas of interest. This entails the assembly of information on ecoregion characteristics and protected area values and interests from all available sources, i.e. recreational opportunities, values and features at an *ecoregion* scale

Step 3: Select study areas. To enable the Local Planning Team (LPT) to choose a study area, the "broad initial areas of interest" identified in Step 1 will have to be described in terms of their recreational opportunities, values and features.

Step 5: Design final boundaries. In order to finalize a study area boundary, additional assessment of the area's recreational resources may be required. This may require:

- additional input relating to local knowledge and stakeholder issues and concerns;
- field work designed to confirm recreational values in boundary areas;
- additional technical assessments of the recreational values of the study areas in question.

3. 0 FIELD–SPECIFIC CONTEXT

3.1 Criteria to be used for assessing values

Step 1: for recreation values, this entails the description of recreation, use and appreciation values at an ecoregion scale. Recreation descriptions for ecoregions will be organized as follows:

- Physical and recreational characteristics
- Opportunities for recreation use and appreciation
- Recreation use and appreciation issues in protected area selection
- Key recreation values and potential

Gaps in representation of recreational values in existing protected areas within each ecoregion will be identified through the above "recreation descriptions".

Step 3: Several criteria can be applied to identify "broad initial areas of interest" that will protect recreational values within each ecoregion. Those criteria include:

- Natural Backcountry Representativeness – the extent to which the "broad initial area of interest" is characteristic of natural backcountry settings (or types of use) within the ecoregion. In the absence of a Recreation Opportunity Spectrum (ROS) for the territory this criteria is covered by the degree of "naturalness" measured under Ecological criteria.
- Diversity – the **variety** and concentration of recreation opportunities or features
- Ability to address public perception and **demands**
- Opportunity for public **use and appreciation**
- **Vulnerability**

- **Rarity, Scarcity and Uniqueness**

(**bolded** terms used as specific criteria terms – see section 3.3 below.)

The significance of recreational opportunities, values or features will be rated on a scale of high, medium or low as a general indication of their relative importance.

Step 5: The same criteria can be used in Step 5 to ensure that recreational values, features and opportunities are retained as study area boundaries are finalized.

3.2 Type and Source of Data to be used for each Planning Step

Recreation Features Inventory. The ***Recreation Features Inventory*** (RFI) is used to identify the recreational values, features and opportunities of proposed protected areas. A simplified version of the B.C. Ministry of Environment manual "Outdoor Recreation Classification for British Columbia) is used for recreational assessment. The RFI is one method of classifying and mapping the land and water for their outdoor recreation values.

The inventory of Yukon recreational resources is made up of two components:

- General narrative reports describing the recreational potential for each 1:250,000 or 1:100,000 scale map areas.
- Corresponding maps portraying numerous polygons (map units) each of which is given three types of symbols related to the kinds of features present and the relative significance of each unit.

Below is a list of the types of features that may be inventoried with their map symbols.

RECREATION FEATURES

A ANGLING
B BEACH
C CANOEING
D HYDROLOGIC FEATURE
N LARGE SURFACE WATERS
P MAN-MADE FEATURE
E^{1} ALPINE/SUB-ALPINE VEGETATION
E^{5} FOREST COVER
E^{8} WETLAND VEGETATION
F WATERFALL OR RAPIDS
G GLACIER OR SNOWFIELD
H ABORIGINAL HISTORIC FEATURE
I EUROPEAN HISTORIC FEATURE
K DEVELOPMENT POTENTIAL
L LANDFORM
M SMALL SURFACE WATERS
Q TOPOGRAPHIC PATTERNS
R ROCK FORMATION
T SPRINGS
U PROTECTED WATER
V VIEWING
W WILDLIFE
Y BOATING

Feature ***significance*** is the main criteria by which recreation values are assessed in any given area. Four categories of recreation significance are used which provide an estimate of the importance of various map units in their ability to:

1. Attract and sustain recreation use
2. Provide aesthetic, educational and interpretation opportunities related to the natural environment and
3. Act as examples of natural areas which exhibit distinctive, unique or characteristic features.(RFI, 1987)

The four significance classes as shown in RFI map legends are:

(++) very high significance	(–) low to moderate significance
(+) high significance	(=) very low significance

The four classes of recreation feature significance are not precise measures partly because such a wide variety of natural features and recreation opportunities are being inventoried at the same time. However, the classes provide a good guideline regarding the relative importance of various areas for outdoor recreation, nature appreciation, education and aesthetics. The areas of highest significance occupy a relatively small portion of the Yukon while areas of lowest significance account for more than 75% of the territory by these criteria.

A feature's significance is measured only in relation to that kind of feature. In the rating of a feature, uniqueness to the region is considered. Although existing access will not affect the significance of a feature rating, it will affect the type of recreation activity which can take place at the time of the inventory related to that feature.

At the time that RFI was conducted it was "designed to aid the Yukon government in identifying candidate areas for a park and outdoor recreation system" (RFI 1987).

Planning Steps

RFI will be used as the main source of data at each of the three YPAS steps identified for this process. Each successive step will require more detailed data.

Step 1: ***1:250,000 scale RFI data will be used at this initial stage to*** **describe** ***the general recreational features to be found at the ecoregion scale. (1:100,000 scale data will be used where available)***

Step 3: ***1:250,000 or 1:100,000 scale RFI data will be used to*** **describe and differentiate** ***between the "broad initial areas of interest".***

Step 5: ***RFI data at varying scales and other data will be used to*** **refine** ***study area proposals. Several types of data may be used:***

1. ***Larger (1:50,000) scale RFI data***
2. ***Local knowledge of recreational values in the study area***
3. ***Fieldwork conducted at the perimeter of the study area. Fieldwork may be required to confirm or refine the recreational values present.***
4. ***Additional landscape analysis or visual resource assessment.***

3.3 Tools and Methods to be Used

Recreation resource criteria include:

- Diversity – the **variety** and concentration of recreation opportunities or features
- Ability to address public perception and **demands**. Includes consideration of the significance of public demand (backcountry and frontcountry), the ability of the area to enhance a travel corridor road-accessible destination, the proximity of the area to population centres and the present growth on population or visitation.
- Opportunity for public **use and appreciation.** Ability to attract and sustain use; ability to foster significant, sustained understanding and appreciation of protected areas; contribution to spectrum of accessibility to representative and natural features
- **Vulnerability.** Includes consideration of the threat of deterioration or loss of a recreation opportunity due to present/potential levels of recreation or industrial use.
- **Rarity, Scarcity and Uniqueness.** RFI considers these factors in determining significance ratings.

4.0 RESULTS

4.1 Valuation tool(s)

RFI uses a four point very high, high, low to moderate and very low significance rating scale to rate recreation values, features and opportunities. It can be used as a general indication of the relative importance of the recreation setting, as perceived by residents, visitors or people who value the area from a distance. It will be used to help identify where the planning process should concentrate efforts.

4.2 Product descriptions

Summary report, with maps, of recreation values, features and opportunities within sample ecoregion.

How Recreation Assessments Apply to YPAS

Value	YPAS Steps		
	Step 1: Identify Areas of Interest	**Step 3: Select Study Area**	**Step 5: Design Final Boundary**
Recreation	1:250,000 scale RFI (Recreational Features Inventory) - data will be used to describe the general recreational features to be found at the ecoregion scale. (1:100,000 scale data will be used where available)	1:250,000 or 1:100,000 scale RFI data will be used to describe and differentiate between the "broad initial areas of interest".	RFI data at varying scales and other data will be used to refine study area proposals. Several types of data may be used: - Larger (1:50,000) scale RFI data - Local knowledge of recreational values in the study area - Fieldwork, to confirm or refine the recreational values. - Additional landscape analysis or visual resource assessment.

appendix 2.7: Renewable Energy Resources Assessment Summary

Prepared by: Yukon Development Corporation, October 2000

1.0 INTRODUCTION

The foundation principles for Yukon energy policy are:

- sustainable development of energy resources,
- efficient use of energy,
- secure supply of reliable energy,
- affordable energy, and
- openness and accountability in energy decision-making.

Reliable and cost-effective electrical power is needed on a long-term basis. Renewable energy resource potential has a central place in the long-term future development of the territory.

For purposes of this paper ***renewable energy resources*** are defined as including *hydro, wind, solar* and *geo-thermal*, although only hydro and wind resources are addressed.

Renewable energy planning for the future is best approached from a territory-wide assessment perspective. The inability to access renewable energy potential in one region or area may have implications for other parts of the Yukon and global concerns, such as air emissions that contribute to the greenhouse gas effect. There is a perception that hydro and wind (and solar) resources are abundant through the territory. Nonetheless, as a result of natural geography and decisions already made, renewable supply options may be limited or not available in all regions of the Yukon.

Among the objectives for the development of Yukon's electrical power system are:

- to minimize reliance on diesel generation
- to achieve self-sufficiency in energy, recognizing that the territory's electrical power system is isolated from other regions of Canada and Alaska.

The ability of Yukon people to choose to use renewable energy in the future is an important consideration. The establishment of protected areas ought not compromise access to or the development of renewable energy resources to meet Yukon needs – present and future, in favor of non-renewable or less environmentally acceptable alternatives without all interests being addressed in the decision-making process.

1.1 Purpose

This paper is one of several that will guide research and analysis for input into the establishment of protected areas. The information provided would be used by governments and local planning teams to recommend candidate protected areas and to make decisions as to the boundaries of

study areas. By identifying other resource values, it is intended that potential conflicts between protected areas and incompatible resource uses will be avoided or minimized. Clearly, the emphasis is on the potential of renewable energy resources to supply the short and long term energy requirements of the Yukon.

This document will focus on:

Step 1 – Identify Areas of Interest,
Step 3 – Select Study Areas, and
Step 5 – Design Final Boundaries.

When a management plan is prepared, there may be opportunities during Step 9 for a protected area to address specific renewable energy interests, including renewable energy resources.

1.2 Scope and Limitations

1.2.1 Renewable Energy Resource Potential

To date assessment of renewable energy resources in the Yukon has primarily focussed on ***hydroelectric*** potential. The hydroelectric potential of the Yukon has been studied at various times, and to varying degrees since the 1950s. Although work is underway to consolidate this knowledge, at this time there is no complete, systematic inventory of potential sites in Yukon and no recent analysis of known potential sites. Nor has there been any recent effort made to rank the known sites, based on current or forecast life cycle assessments, regional alternatives, other energy supply options, economic, population or infrastructure conditions. There is a lack of any, or long-term, hydrological data for many of the smaller rivers and streams.

More recently, the potential of ***wind*** as a source of renewable energy has received attention, and will continue to be explored. Wind monitoring of sites, primarily in areas adjacent to communities, commenced on a more concerted basis in the early 1990's. In June, 2000 a 10-year community wind resource assessment initiative was launched with the goal of developing a wind resource atlas for the territory.

The full extent of ***geo-thermal energy*** sources in the territory is unknown. The importance of assessing this resource for purposes of YPAS implementation is under review.

For purposes of the protected areas planning process, it does not appear necessary to assess ***solar resource potential*** on an ecoregion basis at this point in time.

1.2.2. Life-cycle assessments and energy supply options:

Renewable energy sources are by definition location specific. The alienation of such sources for future generations could have significant implications for the territory. It will be necessary as part of the cumulative social and economic assessment of proposed protected areas, to consider, to the extent reasonably feasible, life-cycle assessments and available energy supply options for the area/region to the potential for hydro and wind energy developments.

2.0 YPAS CONTEXT

Information on the renewable energy potential of the Yukon will be incorporated into the YPAS Planning Steps as follows:

Step 1. Identify Areas of Interest. Assessments at this scale will identify the location of watercourses with known hydro potential. It will include all previously identified sites, based on levels of study that range from *reconnaissance* (primarily an office study) through to *feasibility* (detailed sub-surface evaluation by drill holes and test pits.). Many sites have been studied at the *reconnaissance level*, utilizing existing mapping, flow records, aerial photographs and reports; these reconnaissance studies may or may not have included at least one field visit to the site. Assessments at this broad scale will assist in identifying potential areas of interest (watercourses) to be considered when identifying areas of interest for protection. A map at 1:500,000 to 1:1,000,000 scale will be provided showing the locations of all known potential hydro sites in the territory. Mapping at a different scale may be used to show small scale hydro sites effectively. The hydro sites will be classified by size (expressed in megawatts).

In terms of assessing wind potential, existing information about wind energy potential will be identified. As the wind potential has only recently been investigated as a source of energy, there is limited information available. In addition to knowing the average annual wind speed and the variation in wind speed, the proximity of potential generating site(s) to communities that are currently served by diesel generation or energy transmission corridors are primary considerations. Wind potential in mountainous areas is very location specific, and can vary considerably even from one side of a mountain to another. At present, the primary focus of wind generation is as a means to displace diesel generation in communities not presently served by the electrical grid. A map (1:500,000 to1:1,000,000 scale) showing sites of known potential (or ones that are currently being assessed) will be provided.

The assessments would also identify important gaps in the identification and assessment of renewable energy resource potential and outline a plan of action to rectify deficiencies.

High level information and analysis relating to life-cycle assessments of potential renewable energy resource developments and energy supply options for the area/region would also be considered. This would include regional representation of hydro and wind potential by size, area, and other factors.

Step 3. Select Study Area. Ideally, assessments of renewable energy potential at this stage will attempt to rank the relative importance of the potential hydro sites, based on a set of criteria including but not limited to those described in part 3.0 of this paper. More important sites (watercourses) and their related footprint (area of potential impact) should be considered and avoided in the selection of study areas, wherever possible.

Existing information on potential hydro sites has mostly been collected at the reconnaissance level, including stream flow data. Field assessments of at least two to five years may be required to obtain the information necessary to make informed decisions as to the relative importance of many of the sites that have been previously identified in the past 30 to 40 years. This would include flow monitoring for a minimum of five years for hydro sites of one to five MW size, and

in the order of 10 years for larger sites, along with site/field reconnaissance.

Inventory of potential sites much beyond the reconnaissance level is generally not undertaken by a utility until such time as there is an obvious demand for more detailed information. Unless a particular site or sites may be alienated through protected area and other land use planning processes, there is little immediate need to gather detailed information about potential hydro resources until projections in demand forecast significant increases in electrical load in a particular area. However, where there are potential competing interests in an area, then further study should be undertaken before final land use decisions are made.

In those instances where there is possible overlap with a Study Area and site(s) of known and relatively important hydro potential, further evaluation of the site(s) would be required to confirm the importance of a particular site, relative to other similar sites and energy supply alternatives in the region.

At this stage, information about similar potential sites in the region would be required to assist in comparing and evaluating the relative importance of potential sites in this regional context. At this stage, the area of potential impact of the hydro site would be identified at 1:50,000 scale, based on assumptions regarding storage levels (if applicable) and limited geo-technical appraisal. Hydrological studies would be carried out to determine mean and flood flows, storage and firm flow available.

Step 5. Design Final Boundaries. In those instances where there is a possible overlap with a protected area proposal or a mix of Goal 1 and Goal 2 areas and important hydro, wind or other renewable energy resource potential remains, additional information and analysis supporting a comprehensive social, environmental, and economic assessment may be required.

3.0 METHODOLOGY

There are two types of questions that will need to be addressed to effectively support the YPAS implementation process.

1. What is the resource potential?
2. What is the assessed value of the resource from a long-term perspective?

Subject to resource and time limitations, the first question can generally be answered with some degree of confidence and certainty. Determining value from a long-term perspective is more challenging. In its simplest form, it will be necessary to assess the particular value of a specific site as a source of renewable energy (considering, for example, generation efficiency, available long-term winter flows, likely significance of environmental effects, costs, proximity to known or projected demand). Then the site value would be compared to the value of other sites within the area or region. And finally its importance relative to other energy supply options and implications for the territory as a whole, if any, would be taken into account.

It is recognized that to some extent both questions may have to be addressed at each step in the YPAS implementation process.

3.1 Hydroelectricity

The need to know the magnitude, location and quality of a resource for planning purposes is as true for energy planning as it is for other non-renewable resources. While more than 100 potential hydro sites have, at one time or another, been identified in Yukon and northern British Columbia, hydro-electric power has only been developed at Whitehorse, Aishihik, Fish Lake and at Mayo, along with some privately owned micro hydro.

The selection of a particular site for further investigation is partially driven by the location of the demand (load), existing infrastructure, energy supply options, and other economic, social and environmental factors – all factors that change over time. This assessment paper, however, focuses on resource potential; it does not consider the demand and other economic factors at this time.

The criteria used to assess hydro potential, therefore, relate primarily to the availability of water inflows, and topographical features suitable for hydro development. Corridors for the transmission of electricity to existing or to a potential load also must be identified in any long-term planning exercise in the Yukon.

Hydro project potential/feasibility is determined, to a very large degree, by site-specific conditions. Studies to determine feasibility of any given site fall into three levels:

River/Stream Reconnaissance: River/stream reconnaissance to locate and evaluate possible sites, structure layout and access. These studies are initially done as office studies, utilizing existing mapping, aerial photographs, flow record and reports to indicate possible sites in an area. At least one site visit is included to confirm potential sites, and eliminate those that are not technically feasible. This type of information would be used in Step 1.

Site Reconnaissance: This level of study includes preliminary field investigations to evaluate foundation conditions and construction material availability. Preliminary hydrological studies are carried out, and site topography at scale 1:5,000, 5m contours is prepared. Preliminary estimates of power available and capital costs are made. This information would be required for Steps 3 and 5. This type of information would allow reasonable and fair comparisons to be made of multiple sites in a region.

Feasibility Studies: Much more detailed field investigation of ground conditions is carried out, including drilling and digging test pits to assess foundation conditions. Site topography at 1:2,000 scale or 2m contours is prepared. Detailed office studies are carried out to determine structure sizing and location, power availability, and more detailed capital cost estimates. This type of information would, for the most part, not be required during the planning phases for Protected Areas. Information of this nature is costly and time-consuming to obtain, and decisions to proceed to this level of study of a particular site would generally be made given appropriate economic conditions and load forecasts at some future time.

3.1.1 Criteria Used to Assess Hydro Potential

Hydroelectric plants can be developed either as run-of-river plants (similar to the Whitehorse Rapids generating station), or water storage plants (similar to the Aishihik generating station). The greatest advantage of a storage plant is its ability to preserve water until it is required for generation. Run-of-river plants tend to have lower capital costs due to reduced amount of civil work and are often associated with less significant effects on the environment.

It is useful to describe hydro potential in terms of the estimated site's capacity, expressed in megawatts (MW), as follows (existing hydro facilities are included for comparison):

Large Projects	over 100 MW capacity	*none at present*	
Mid-sized projects	5 to 100 MW	*Whitehorse Rapids* *Aishihik Hydro*	*22 - 40 MW** *30 MW*
Small Hydro	less than 5 MW	*Mayo* *Fish Lake Hydro*	*5.0 MW* *1.5 MW*
* Capacity is reduced in winter due to lower flows in Yukon River			

The key criteria used to evaluate ***hydro 'potential'*** include:

- Available long-term flows (determine long-term average annual flow as well as minimum and maximum flows)
- Available winter flows (winter flow is important given higher demand for power during colder temperatures)
- Available storage (provides water when needed to generate power; can be seasonal storage, or multi-year storage)
- Power generation efficiency of site (such as the available head)
- Suitable topography and site conditions

These criteria can be applied to evaluate the resource potential, and to provide a basic level of comparison of potential sites.

The key criteria used to assess ***hydro 'value'*** include:

- Environmental effects (smaller, run-of-river plants tend to have fewer environmental implications than larger plants , but cumulative effects of several smaller plants to be considered)
- Cost per installed kilowatt of capacity and kWh of energy (lowest long term cost is preferable)
- Accessibility of site (changes over time as road access is developed)
- Proximity to load (this changes over time, especially with respect to isolated industrial loads)
- Proximity to existing electrical power transmission system (this changes over time as Yukon power system is expanded)
- Compatibility with existing generation sources on the Yukon power system (run-of river matched with storage facilities)
- Other life cycle assessment factors
- Other energy supply options

The criteria that change over time, such as site accessibility, proximity to load, proximity to the electrical transmission system, and compatibility with existing generation resources can only be considered as valid estimates for a given forecast period. For the purposes of YPAS, these criteria would be given a lower weighting in the assessment of hydro potential as they are only applicable to the current and short-term economic and infrastructure conditions in the territory. A site that may not appear to be important today may become very important in the future as the load forecast changes, demand for power occurs in areas where previously there was none, the Yukon power network is expanded, and other environmental and economic conditions change.

3.2 Wind Potential

Assessing wind potential in mountainous terrain such as the Yukon tends to be location specific, and varies considerably depending on local topography, elevation, proximity to coastal areas, high mountain ranges etc. ***The factors used to assess wind potential would, to a very large degree, be driven by local demand for power, and/or the desire to offset diesel generation in local communities, or at individual, remote establishments.*** Non-Yukon power network connected systems, or stand-alone systems are those which can provide power solely from the wind, or hybrid systems such as a combination of wind/diesel, or wind/hydro.

One of the first steps in determining if a wind energy system is feasible is determining how much wind is available at a particular site. This requires measuring the wind speed over a period of time, thereby estimating the average annual wind speed, and the variation in wind speed. A wind energy system usually needs a minimum average annual wind speed of 15 km/h to be practical; this can vary, however, depending on the circumstances. Wind speeds greater than this are desirable. Local topographic conditions need to be considered as these play an important role in determining the wind energy potential in a particular location.

Under current arrangements, Yukon Development Corporation's standard is to monitor small-scale sites for at least 12 months and larger-scale sites for at least 24 months.

4.0 EXISTING INFORMATION

4.1 Hydro potential

Reconnaissance Inventory

Yukon Development Corporation is presently engaged in compiling an inventory of all previous hydro potential studies that have been carried out since the 1950s. Studies conducted prior to 1990 generally focussed on the mid-size and mega projects, of which over 100 potential sites have been identified in Yukon. In the 1990s, some attention was focussed on sites ranging from 1 to 5 MW, in addition to a few micro hydro investigations (less than 1 MW). The level of investigation carried out varies from purely office studies to pre-feasibility standard. Work has been started to identify the deficiencies in the current inventory to better support long-term resource planning.

Any assessment of hydro potential relies on long-term flow data. Water Survey of Canada monitors flows on the larger river systems in Yukon, and Water Resources Division of DIAND maintains a stream flow monitoring program on a number of smaller streams in the territory. Due to program cuts a number of hydrometric stations have been eliminated, thus data is no longer being collected at all of the stations. Flow data collected by private parties is not in the public domain.

The Reconnaissance Inventory would need to include information from both the river/stream reconnaissance and site reconnaissance levels of study. This would enable informed evaluation of the relative importance of sites of known hydro potential, and assist in YPAS and regional planning.

Reconnaissance Inventory

Task	Time and Costs
Stream Flow Monitoring	- need to determine what is, and is not being monitored, where data is required; - estimate 5-10 year program to make a dent in the data gaps; - costs are largely dependent on the level of monitoring and are under review.
Review of Existing Studies	- consolidate information on known sites in a standard and accessible format; - develop GIS mapping and computerize hydro inventory database; estimate 6 –12 months; - identify any major gaps (geographically, by size of project, etc.), estimate 6 – 12 months; - costs are under review.
Fill Data Gaps	- conduct reconnaissance level study to fill critical information gaps; - estimated time at 2 –5 years depending on scope of the gaps.
Energy Transmission Corridors	- identify potential transmission corridors for Yukon power system development (Assume follow existing or planned transportation/telecommunications corridors for the most part. Need to secure rights-of-way for future transmission line(s). Limited effort put into where spur lines might go in future as this depends on where the load is.) - mapping and some terrain evaluation costs.

4.2 Wind potential

Atmospheric Environment Services collects considerable information on upper air systems. Conceptual planning is being initiated for the long-term development of an energy resource-related wind atlas for the territory.

Detailed information on Yukon's wind energy resource potential is limited to 7 sites in proximity to 6 communities or rural areas. Monitoring of 8 sites is currently in progress.

The scope and costs of the work that ought to be undertaken for YPAS implementation planning is under review.

5. 0 RESULTS

5.1 Rankings

Rankings will be applied to the values being assessed. These will be qualitative and quantitative rankings, allowing a relative comparison of the importance of each potential hydro site in the area, regional, and territorial context. The rankings will be based on the descriptive criteria and other assessment considerations outlined above. Sites will be ranked High, Medium or Low.

5.2 Reports and Maps

The hydro potential information is well suited to GIS analysis, and can be presented as a thematic map. Sites of different sizes and rankings can be presented in different colours and symbols. An accompanying text would describe the attributes of each site, how the criteria and other considerations were assessed, and the ranking derived.

How Renewable Energy Assessments Apply to YPAS

Value	YPAS Steps		
	Step 1: Identify Areas of Interest	**Step 3: Select Study Area**	**Step 5: Design Final Boundaries**
Renewable Energy Resources	- study levels range from ***reconnaissance*** (utilizing existing mapping, flow records, aerial photographs and reports) through to ***feasibility*** (detailed sub-surface evaluation by drill holes and test pits.). - broad scale assessments help identify potential areas of interest (watercourses) to be considered when identifying areas of interest. - 1:500,000 to 1:1,000,000 maps show locations of known potential hydro sites and wind power sites. Different scale may be used for small scale hydro potential sites.	- assessments at this stage rank the relative importance of potential hydro sites - field assessments of 2 to 5 years may be needed to determine the relative importance of known sites. - includes flow monitoring for a minimum of 5 years for hydro sites of i to 5 MW size, and in the order of 10 years for larger sites, along with site/field reconnaissance. -1:50,000 scale maps	- where there is a possible overlap with a protected area proposal or a mix of Goal 1 and Goal 2 areas and important hydro, wind or other renewable energy resource potential remains, additional information and analysis supporting a comprehensive social, environmental, and economic assessment may be required.

Appendix 2.8: Tourism Assessment Summary

Prepared for: Tourism Yukon, October 2000

1. 0 INTRODUCTION

Tourism is vital to the economy of the Yukon and continues to demonstrate growth potential. Its increasing role in the livelihoods of Yukoners and in decisions on land and resource use has prompted a new look at tourism planning for the territory.

In 1999, nearly 270,000 travellers visited the Yukon. Estimated annual tourism revenues now exceed $125 million. The industry is Yukon's largest private sector employer – more than 2000 people are working in the tourism sector for 1180 Yukon businesses. Approximately 70% of Yukon private sector employees work for businesses that report some level of tourism revenue.

1.1 Purpose of this Paper

The purpose of this paper is to outline how Tourism Yukon can contribute to the three critical Yukon Protected Areas Strategy (YPAS) Planning Steps.

Referring to YPAS Guidelines, these steps are:

Step 1: Identify areas of interest.
Step 3. Select study area(s).
Step 5. Design final boundaries.

1.2 Scope and Limitations

Tourism Yukon will identify tourism values in candidate protected areas and provide a qualitative assessment of them to:

- Estimate the significance of natural and cultural assets to tourism potential;
- Estimate the kinds of potential tourism activities that might realistically occur in the study area; and
- Determine the likelihood of conflicts with competing resource uses in the study area.

Initial data sources for ***tourism assets*** will include landscape, resource, and infrastructure information obtained from YPAS-coordinated inventories and GIS analysis. These may be augmented by aerial or field reconnaissance.

Information about current ***tourism activities*** within a study area will be obtained from the *Wilderness Licensing Act* (within limits prescribed by ATIPP) and interviews with informed sources such as local residents, guides, outfitters, trappers, resource managers and air charter companies. General and supporting information will be obtained from the Yukon Visitor Exit Survey, Border Crossing data, market and product research, and visitor use and expenditure data

collected in comparable northern parks.

2.0 YPAS CONTEXT

Tourism Yukon will supply information and analysis into YPAS planning steps as follows:

Step 1. Identify Areas of Interest. YPAS will identify general areas of interest at an ecoregional scale. Tourism assessments will identify the kinds of cultural and natural assets present in the landscape that can in principal support various kinds of tourism activities. Data sets will be inventories, photographs and GIS-generated maps obtained from YPAS, as well as information obtained from the *Wilderness Licensing Act* on current commercial tourism activities. Assets that will be considered include:

- Location, access, existing infrastructure
- Landforms and topography
- Scenery
- Special natural features
- Wilderness values
- Lakes and watercourses and suitability for recreational travel by various watercraft
- Trails or overland routes and suitability for various kinds of recreational travel (i.e. foot, horse, vehicles, ski, snow machine, dogteams)
- Wildlife viewing potential, fishing potential
- Cultural and heritage assets.

Step 3. Select Study Area(s). For the specific study area identified by Step 1, Tourism Yukon will assess the quality, significance, and specific location of tourism assets, particularly with respect to potentially competing or incompatible resource uses. Tourism assessments will consider activities and developments that are possible and realistic based on the tourism resources present in the study area. They will identify current or recent tourism activities, and will consider potential activities based on comparisons of tourism activities in similar northern protected areas, and analysis of market and product trends.

For any tourism scenario, the assessment will state what management and order of magnitude investment assumptions might be necessary. These may include:

- Type and location of access including roads, trails, air and water access
- Possibility of constructing facilities such as lodges or camps,
- Restrictions on types or locations of visitor activities,
- Potential for conflicts between tourism segments and between tourism and other resource interests.

The locations of potential tourism assets and areas of activity will be mapped so that YPAS planners can consider these values in determining boundaries and in segregating incompatible resource uses.

Step 5. Design Final Boundaries. Tourism values influence final boundaries in two ways:

1. To identify specific areas to be ***included*** – sites having significant tourism values that would be compatible with protected area objectives;

2. To identify specific areas to be ***excluded*** – sites likely to have activities incompatible with the purpose of the protected area.

The analysis generated in Steps 3 and 5 will identify the locations of specific tourism values and will identify areas of potential conflict that should be reflected in drawing final boundaries. Current use patterns, access nodes (including trailheads, landing strips and floatplane lakes), existing or potential travel routes, and concentrations of high-quality tourism values will help to identify areas of concern.

3.0 HOW TOURISM VALUES WILL BE ASSESSED

3.1 Assessment objectives.

YPAS tourism assessments must gauge existing uses and project potential uses within a study area. Assessments consider the following:

1. What is *present* in the landscape (natural and cultural assets, infrastructure);
2. What is likely to be *permissible* in the landscape (management objectives and limits);
3. What is likely to be *possible and plausible* in the landscape (based on 1 and 2, above, and on likely market demand).

3.2 Assessment Criteria

Tourism values and potential will be assessed based on the following:

- Current tourism and recreational use;
- Tourism assets – natural features, cultural features;
- Tourism activities in existing protected areas that are comparable to the study area;
- Market research on tourism trends;
- Access and infrastructure;
- Constraints to tourism.

3.2.1 Current tourism and recreational use

This information establishes a baseline for tourism activities, identifying what is known to be possible and practical, and provides a first-level identification of the natural and cultural tourism assets. Commercial tourism activities can be assessed from the *Wilderness Licensing Act*, as well as product listings in the *Tourism Product Inventory* database. Guides and operators, conservation officers, outfitters, Yukon-based clubs and associations, and First Nations can be interviewed for information about current uses. For remote areas, air charter firms can be canvassed.

3.2.2 Tourism assets – natural features & cultural features

This information provides additional insight concerning what is of interest in the landscape to tourism. The inventories of natural and cultural resources assembled under the "Environmental Accounts" section of the ***Multiple Accounts Analysis Framework*** [see appendix report # *] will contribute to this part of the assessment. It is anticipated that environmental accounts information will be presented in descriptive, quantitative, GIS, and photographic formats. Tourism analysis

of this information may be supplemented by interviews with people with field experience in the study area, and by aerial or field reconnaissance. The existence of tourism assets in a study area is a matter of fact – assessing the quality or significance of these assets is a matter of judgment, which will require additional information.

3.2.3 Tourism Activities in other Protected Areas.

The quality and the potential of tourism assets in the study area will be assessed by comparisons with established protected areas that are similar in terms of access, size, location, landforms and other environmental features. The types of tourism activities, the kinds of developments and infrastructure, and numbers and economic contributions of visitors will be examined in these established areas. Information will be obtained from area administrators and tourism operators. This will include management plans, park publications and guides, visitor use statistics, and interviews with managers, field staff, and visitor services personnel.

3.2.4 Market research on tourism trends

Market research on tourism trends will help indicate whether markets exist or are emerging for the kinds of tourism experiences that are possible in a study area.

3.2.5 Access and infrastructure

The type of access available in the study area, or the access that might be permitted by a management plan helps to determine the kinds of tourism opportunities that are possible and plausible. Road access creates tourism opportunities quite different from the opportunities presented by air access. Similarly, a protected area that permits developments such as accommodations and trails would have different tourism opportunities than would an ecological reserve.

3.2.6 Constraints

A variety of constraints may limit the tourism potential of any protected area:

- ***Natural limitations*** such as an absence of high-quality scenery or an absence of navigable waterways or a lack of landing sites pose unavoidable constraints.
- ***Location*** can be limiting in two ways: an area can be genuinely remote (no road access), or it can be out-of-the-way, far from well-used transport corridors.
- ***Management objectives*** can also constrain opportunities by limiting visitor numbers and visitor activities, as well as by limiting options for access and other developments.
- ***Economic and market constraints*** may bear upon the Yukon market as a whole or may be specific to a study area. These would be indicated by market research.

3.3 Time and Costs.

Cost will be a direct function of the need for additional research and professional analysis time. In each planning step, tourism assessments rely on environmental accounts information furnished to YPAS by other agencies.

Tourism Yukon's response time for each step will depend on:

- receiving the needed information,
- the quality of the information,
- the size of the study area, and
- the potential complexity of its tourism options.

Analysis for each step can take from one week for small, well-defined study areas to several months for study areas that require extensive interviews and research. Generally, high-quality information will reduce turnaround time. It is likely that tourism assessments will require specialist consultants.

4.0 RESULTS

4.1 Rankings

Rankings applied to tourism values will be qualitative and comparative as in High, Medium, and Low. Tourism values will be segregated into ***Frontcountry opportunities*** (road accessible) and ***Backcountry opportunities***.

4.2 Reports

Tourism assessments can be presented as written reports supplemented by maps showing the location and significance of tourism values and opportunities. Maps are particularly useful in identifying the potential for conflicting uses.

How Tourism Assessments Apply to YPAS

Value	YPAS Steps		
	Step 1: Identify Areas of Interest	**Step 3: Select Study Area(s)**	**Step 5: Design Final Boundaries**
Tourism	Data sets will be: inventories (RFI)*, photographs and GIS maps from YPAS, & information on current commercial tourism activities. Assets include: location, access, existing infrastructure, landforms and topography, scenery, special natural features, wilderness values, lakes and watercourses and suitability for recreational travel by watercraft, trails or overland routes and suitability for recreational travel, wildlife viewing potential, fishing potential, cultural and heritage assets.	Tourism Yukon will assess the quality, significance, and location of tourism assets, to identify potential competing or incompatible resource uses. Assessments consider potential activities and developments based on the tourism resources. They will identify current or recent tourism activities, and will consider potential activities based on comparisons of tourism activities in similar northern protected areas, and analysis of market and product trends.	The analysis from Steps 3 and 5 will identify the locations of specific tourism values and areas of potential conflict. Areas of concern will be identified using: current use patterns, access nodes, existing or potential travel routes, and concentrations of high-quality tourism values.

* RFI = Recreation Features Inventory

Note: For more detailed information, see the complete technical report from which this summary report was taken. This is available from Tourism Yukon, Robert Clark, tel. 667-5632.

Tourism Yukon
2000 *Assessing Tourism Benefits in Yukon Protected Areas – Recommendations on Methodology for Tourism Yukon and YPAS.* Draft report prepared for Tourism Yukon, Industry Services Branch by David Loeks, TransNorthern Management Consulting.

appendix 2.9: Transportation Assessment Summary

Prepared by: Community and Transportation Services, Yukon, October 2000

1.0 INTRODUCTION

This paper is to provide a summary of the steps which must be taken to ensure the consideration of transportation values during the identification and subsequent alienation of land through the Yukon Protected Areas Strategy (YPAS) initiative. Attention to the concerns generally described in this paper at the very early stages of protected area identification can contribute positively to YPAS work and minimize the potential for future conflict related to the access component of transportation supply.

The identification of protected areas relates to transportation in three distinct ways:

- the effect that a protected area may have on the existing transportation system,
- the effect that a protected area may have on future land access, and
- the impact that a protected area may have on infrastructure development needs.

Each of these factors must therefore be included in the protected area assessment framework. The information which follows will suggest the extent to which this can be achieved at the three crucial early steps in the YPAS planning process.

2.0 YPAS CONTEXT

The framework development guidelines suggest three steps in the protected area identification process during which specific assessments might be required. These steps include identifying areas of interest, selecting study areas, and designing final boundaries. The transportation perspective can most effectively be provided at two levels - a regional one and a local one. Consideration of the transportation principles identified above within the YPAS process can be carried out as described in the following paragraphs.

Step 1: Identify areas of interest. Regional transportation values need to be included as an assessment factor on an ecoregion basis.

Step 3: Select study area. Regional level transportation information is also likely to be sufficient for the selection of study areas. Regional transportation requirements have been identified for most areas of the Yukon as this information was required as input to the Land Claims process. Although there has been no formal approval by the Yukon Government for the needs identified, there is precedent for using the work done as a policy basis. The crucial influence in identifying potential regional transportation requirements has been to understand that, at some future date, it may be necessary to provide ground based access to any area of the Yukon.

Step 5: Design final boundaries. In many cases, regional level transportation information will be sufficient for this purpose as well. In other cases it may be necessary to develop a more specific level of transportation information (a location study) to facilitate final boundary design. Few

specific location studies exist at the present time as work of this kind is usually done only in response to a specific development proposal. A typical location study would involve adding to the regional information available through map study at the most detailed scale available, air photo analysis, and an appropriate level of field reconnaissance. This level of effort would identify a more specific transportation corridor of reasonable width without undertaking actual engineering fieldwork such as topographic surveying and material testing.

3.0 TRANSPORTATION CONTEXT

Two levels of transportation study which may be required as input to the YPAS process: regional transportation requirements and location studies. Both have characteristic data requirements, procedures, assessment criteria, time and cost aspects. This section provides these details to the extent that this can be done in a general way. Specific changes or additions to the transportation analysis may be required in response to factors unique to a particular protected area.

3.1 Regional Transportation Requirements

As noted above, a considerable amount of work has been carried out to identify regional transportation needs in the Yukon. In most cases, needs have been considered in response to development proposals of various kinds or as input to Land Claims negotiations. The amount of regional transportation information available is therefore relatively complete in areas where these two activities have commonly occurred and less complete in other areas. Identification of regional transportation needs information is based on large scale mapping (typically 1:250,000 or greater) with the primary aim being to ensure that a practical land access route to every area remains available.

The criteria considered in identifying regional transportation needs include:

- the effect of a particular proposal on the existing transportation system,
- the effect on future access and
- the infrastructure development needs associated with the project.

These criteria would remain applicable for the purposes of identifying protected areas. The mechanism used to consider the transportation effects of projects is a group formed from within government known as the Transportation Lands Review Committee (TLRC). This group consists primarily of staff of the Transportation Division of C&TS and has been in existence for several years. Over this time a substantial body of regional transportation needs information has been generated. This information is applicable to protected area identification and can be made available through referral of the protected area proposal to TLRC. The same procedure would apply where a potential protected area is identified at a site in a region not considered to date by TLRC. Referral to the committee can be carried out quickly and at little cost so that the transportation aspects of the proposal can be made known to the YPAS process.

3.2 Location Studies

A specific location study may be required in certain instances to clearly define transportation needs. The results of a study of this kind would be used as a basis from which to resolve a

conflict between transportation and protected area requirements.
A transportation location study uses an iterative process to refine data to the point where a specific route or site for a facility can be identified. From the starting point at the 1:250,000 scale used for regional work map study at more detailed scales is initiated. This map study takes into consideration the general topography in an area, drainage patterns, and elevation as well as the engineering requirements of the facility being considered. Where air photography is available, analysis of this information can add significantly to the results of the study. A location study also typically involves some level of ***ground truthing*** of the map study information, either by air or ground reconnaissance.

The criteria used for a location study are the same as those cited above for the identification of regional transportation needs. There are also a wide range of time and cost factors that may apply to a location study. Where all the necessary information is available and the site is relatively accessible, short time frames (up to two months) and low costs (a few thousand dollars) apply. Where the opposite is true, longer time frames and higher costs are likely. As an example, the location work done in conjunction with the identification of boundaries for the Fishing Branch protected area took about six weeks and cost approximately $20,000.

4.0 RESULTS

The results of both regional transportation needs identification and specific location studies are similar in format even though the level of detail provided is substantially different. Typically, a short report incorporating text and mapping will be produced. Incorporation of this information into protected areas documents should be straightforward.

The ranking of transportation values will be based on two of three criteria used in the transportation analysis. The effect on the existing transportation system and the effect on future access are both highly relevant to protected area selection. The third criterion, effect on infrastructure development needs, is not.

4.1 Effect on Existing Transportation System

Quantitative ranking with this criterion is not possible without a significant degree of coordination among all the factors affecting the selection of protected areas. Qualitative ranking is possible along general lines. If the selection of a protected area affects a primary highway or regularly used airstrip, then the transportation value is high. If a secondary road or occasional use airstrip is affected the transportation value is not as high and may in fact be very low if the facility is seldom used. If the protected area has no effect on any existing transportation facilities then the transportation value is nil.

4.2 Effect on Future Access

Only qualitative ranking is realistic with respect to this criterion, for the same reasons detailed in part 4.1. The relative value of future access is entirely dependent on what development potential there is on the land affected by the protected area, or on land that may only be accessed through the protected area under discussion. If there are no known development pressures within or

beyond the protected area being dealt with, the transportation value of future access is low. If there are potential developments (mining, tourism, oil and gas, recreation, forestry, parks, agriculture, etc.) that may require access then transportation values are higher. If there is a known development for which access development is pending the transportation value is highest. A significant consideration with respect to future access may be the implementation of the protected area itself either from the perspective of providing public access to the area or from the perspective of preventing such access.

The third criterion is not particularly relevant to the initial stages of the YPAS process as it can be dealt with after decisions on the future of the protected area are made. If infrastructure development becomes a requirement, it can be included in the area development plan. If alienation of a protected area precludes the need for infrastructure development, existing plans can be altered accordingly.

The inclusion of transportation values in the multiple accounts analysis is not a requirement. Transportation values are included in at least three of the socio-economic factors already identified including:

- impact on public use and enjoyment,
- impact on resource based industries and
- impact on other commercial activities.

Transportation specific subheadings can be created under each of these three main topic areas as the multiple account analysis framework is further developed.

How Transportation Assessments Apply to YPAS

Value	YPAS Steps		
	Step 1: Identify Areas of Interest	**Step 3: Select Study Area(s)**	**Step 5: Design Final Boundaries**
Transportation	- Identify regional transportation needs to ensure there is a practical land access route to every area. - plotted on large scale maps (1:250,000 or greater)	- similar to process for Step 1, examining regional transportation needs.	- may require location studies. - this may involve map study at more detailed scales, analysis of aerial photography if available, and some level of ***ground truthing*** - results recorded in brief report and maps.

appendix 2.10: Other Economic Values Resource Assessment

Prepared by: Economic Development, Yukon, October 2000

1.0 INTRODUCTION

This paper is intended to provide guidance for the assessment of "other economic" values in the socio-economic assessment of the Yukon Protected Areas Strategy (YPAS).

The technical paper provides a more detailed discussion of the theoretical and technical background for the assessments.

(**Note:** See page 55 for definitions of some of the economic terms used in this report.)

1.1 Scope

"Other economic" values include a range of economic values which are not otherwise being considered separately in the assessments. They may be best defined by what they do *not* include. This paper does not address the direct assessment of mineral, oil and gas, forestry, hydroelectric, ecological, socio-cultural, or tourism values. However, it does address some of the impact of these on major economic and fiscal variables.

"Other economic" values do include four distinct categories of values:
1. impacts on other industry sectors (not addressed in other papers);
2. overall impact on major economic variables (employment, income, output);
3. impact on government revenues and expenditures; and
4. consideration of non-monetary economic values

The second and third categories of impacts (on major economic variables and on government revenues and expenditures) incorporate the indirect effects of other values being assessed, such as mining and tourism, on these variables.

This paper addresses how values in these areas can be assessed as part of the YPAS process.

1.2 Limitations

Many of the economic impacts cannot be reliably assessed until the management planning stage, when there should be much clearer ideas of what activities will and will not be permitted in the proposed protected area. Estimates of economic impacts in many of these areas are likely to be highly speculative prior to the management planning stage.

Since this exercise is intended to focus on assessment of values in steps 1-3 of the YPAS process (identification of areas of interest and identification of study areas), this paper will focus on what of these economic values can be reliably assessed at these initial

stages. However, because there is little that can be definitively assessed prior to the management planning stage, this paper will also point to criteria and assessment tools and methods that will be used at the management planning stage (Step 9).

2.0 YUKON PROTECTED AREAS STRATEGY CONTEXT

The following matrix outlines where assessments of "other economic values" fit in the Protected Areas Strategy process and the scale and scope of assessments at each stage.

The numeric steps in the columns correspond to the steps outlined in the *Wild Spaces Protected Places* report (pages 19 – 24). The alphabetical listing of values correspond to the impacts on "other economic values" listed above.

Economic Assessments in the YPAS Process

Types of "Other Economic" Values	YPAS Steps			
	1. Identify Area of Interest	3. Select Study Area	5. Design Final Boundaries	9. Prepare Management Plan
A. Other industry sectors (agriculture, trapping, fishing, hunting, etc.)	Identification of existing or potential activities in areas of interest for these sectors.	Determine, at rough scale, magnitude of existing and potential activities for these sectors (e.g., # of traplines, soil quality, etc.).		Estimates of the impact of the proposed park on activities in these sectors (e.g., changes in the level of production or income for these activities).
B. Impact on major economic variables (employment, income, output, etc.) C. Impact on government costs and revenues	No estimates of impacts on these variables available at this stage.	Estimates highly dependent on detail and quality of information available from other assessments. Comparative economic and employment multipliers can be provided to planning team for illustrative purposes, as well as economic profiles of affected communities and industry sectors. If reliable and specific estimates of the impact on major sectors (tourism, mining, forestry, etc.) are available, then rough estimates of the impact on major economic variables and on government revenues and spending can be provided.		Estimates of impacts on major economic variables and on government revenues and spending based on best estimates of impacts for other sectors and/or different scenarios for development.
D. Consideration of non-monetary economic values	Acknowledgement of significance and concept of these values, but no further analysis possible.	Consideration and discussion of whether any of the non-monetary impacts may be significant and are not considered elsewhere. Identification of existing and potential traditional economy uses.		Consideration of whether and how alternatives and mitigating measures will significantly affect non-monetary economic values.

3.0 FIELD-SPECIFIC CONTEXT

The proposed criteria, data and tools to be used in assessing each of the types of other economic values at each step in the YPAS process are outlined in the main technical paper on economic values[3].

The assessment of the economic impact is heavily dependent on accurate information being provided by other assessments, in particular assessments of the resource sector and tourism.

The scale and scope of the economic assessments will vary considerably at each stage of the YPAS process. As more specific information becomes available, more specific economic assessments will be possible. In addition, the scale and scope will also depend on the significance of the impacts for each protected area.

Since there will probably be a lack of more specific information at early stages of the YPAS process, generic data and economic profiles of communities and regions will be provided as background for the assessments.

Where reliable specific quantitative data on expected impacts is available, it will be put into an economic impact model to calculate the impact on employment, income and output for different sectors, using a model similar to those used by Parks Canada, British Columbia, the Northwest Territories and other jurisdictions. Economic impact models in general only take account of the impacts associated with park management and visitor spending and do not consider any of the negative impacts in terms of foregone resource opportunities.

While economic impact models can provide rough estimates of the economic impacts of protected areas, the actual impact will depend heavily on whether local communities have the capacity and ability to take advantages of the economic opportunities associated with protected areas.

While cost-benefit analyses are not appropriate for these assessments and will not be performed as part of the Multiple Accounts Analysis, the cost-benefit framework can provide a useful framework for a consistent analysis of impacts, which may be absent in Multiple Accounts Analysis. In particular, the cost-benefit approach requires an explicit specification of base case projections, analysis of impacts (and discounting) over time, measures to prevent double-counting and a consideration of the impacts on different regions. The various assessments should take account of some of these factors, such as the time period of different impacts.

---

[3] *Yukon Protected Areas Strategy Implementation Review: Other Economic Values Technical Paper*, Whitehorse: Yukon Government, Department of Economic Development, 2000.

4.0 RESULTS

4.1 Valuation Tools

Valuation tools and methods to be used are expected to include:

- **Other Industry Sectors** : Generally maps and visual reviews.
- **Major Economic Variables**: Input-output analysis; economic impact model (to be developed); spreadsheets to calculate income, expense, revenue and other ratios.
- **Government Costs and Revenues:** Data from economic variables assessment (using input/output analysis and an economic impact model); use of ratios of revenues and spending.
- **Non-monetary economic values**: May require use of economic techniques for estimating personal non-market benefits, such as contingent valuation, travel cost, hedonic methods, benefits transfer or other techniques.

4.2 Product Descriptions

The following appendix outlines what types and levels of assessment information will be provided at each step of the YPAS process. These summaries also include commentaries on some of the pertinent issues at each stage.

Note: For more detailed information, see the complete report from which this summary was taken. This is available from the Yukon Department of Economic Development, tel. 667-5946.

Yukon Government, Department of Economic Development
2000 *Yukon Protected Areas Strategy Implementation Review: Other Economic Values Technical Paper,* Whitehorse, 2000.

GLOSSARY OF ECONOMIC TERMS

Benefits Transfer: Refers to the use of estimates of values obtained in one context to estimate values for similar projects in another context. For example, estimates of the cost of a particular level of pollution from one study might be used in another study without replicating the research and analysis that went into deriving the estimate.

Contingent Valuation: Survey that involves asking participants how much they are willing to pay for certain goods or services. Used when there are no appropriate market prices for the goods or services.

Cost-Benefits Analysis: A formal assessment of all the private and social (including environmental and cultural) benefits and costs of a project. Includes estimating the value of impacts that are not reflected in market prices and discounting future impacts to present values using a discount or interest rate.

Economic Impact Assessment: Estimate of the impact of a project on a series of economic variables, such as employment, income, revenue, GDP. Includes the estimation of direct, indirect and induced effects, but does not attempt to estimate either the costs of the project or the non-market values of the social, environmental and cultural impacts.

Economic or Employment Multipliers: Estimates obtained from economic analysis of the total (including direct, indirect and induced) economic impact of spending in certain areas. Multipliers are commonly estimated for output, income, employment and revenue. "Input-output models" of the economy are used to estimate multipliers.

Existence Values: The non-use value that people place on the mere existence of something, such as a natural resource, environmental quality, culture or species.

Hedonic Pricing: Method of estimating the implicit value of the different attributes of a good or service, based on the observation that each good is a bundle of different characteristics. For instance, the value of a house is a function of its size, physical attributes, aesthetics and location. Hedonic pricing involves estimating the implicit value of these different attributes by using mathematical regressions.

Multiple Accounts Analysis: Identification of the impacts of different options or scenarios on a specified set of values.

Option Value: The non-use value that people place on preserving the option of using something in the future.

Travel Cost Method: Method of estimating the value that individuals put on different services, particularly recreational activities, by calculating the costs incurred

travelling to a site and participating in activities.

APPENDIX: SUMMARY OF ECONOMIC INFORMATION TO BE PROVIDED AT EACH YPAS STEP

OTHER ECONOMIC VALUES AREA OF INTEREST: STEP 1

Assessment of *other economic values* at the area of interest stage will focus on assembling information from existing sources about existing third party interests and potential for development in "other industry sectors". These other industry sectors include commercial activities in trapping, fishing, hunting and other industries. Non-commercial activities can be considered in other assessments, including socio-cultural heritage assessments and non-monetary economic values. If the activity is related to tourism (e.g., fishing or outfitting activities) then this should be considered in the tourism assessment.

Lack of reliable or specific data about the impact of options at this stage will preclude any assessment of the impact on major economic variables or government revenues and spending.

A generic discussion of the significance and concepts of non-monetary economic values (not considered elsewhere in the multiple accounts analysis) will also be provided.

Other Industry Sectors

- map of existing farms at territory level
- map of potential agricultural land at territory level
- fishing and hunting activity
- map of existing traplines at territory level
- information on other commercial activities

Major Economic Variables

- no data or analysis

Government Revenues And Expenditures

- no data or analysis

Non-Monetary Economic Values

- Generic discussion of significance and concepts of non-monetary economic values.

OTHER ECONOMIC VALUES AREA(S): STEP 3 **SELECT STUDY**

Assessment of other economic values at the study area selection stage will focus on collecting more specific information about potential impacts on "other industry sectors".

If reliable and specific quantitative data is available about the anticipated impact of study area alternatives on major sectors (resource industries, tourism, park management), then it will be possible to provide some assessment of the impact on major economic variables (employment, income, output) and on government sector revenues and spending.
If this information is not available, then no reliable assessment of these economic values will be possible, as it would be based on highly speculative conjecture. For instance, if the assessments of mineral, other resource and tourism values provide only ordinal rankings and no measurable quantitative data, then the economic impact in these areas obviously cannot be quantifiably estimated.

However, generic multipliers and impact estimates for affected industry sectors from Yukon input-output accounts can be provided, as well as a description of the industry sector. Rough boilerplate estimates of the economic impact of different magnitude visitation levels may also be provided, using an economic impact model (to be developed).

Finally, where there is likely to be a significant impact on non-monetary economic values (not considered elsewhere), these will be considered. In particular, the consultation process with members of the local community can help to identify existing and potential traditional activities that may have an economic impact. Traditional knowledge may be used as part of this assessment process.

Other Industry Sectors

- map and/or data of existing farms at study area level
- map of potential agricultural land at study area level
- map and/or data of existing traplines within area of interest
- information on number and types of other commercial activities within area of interest

Major Economic Variables

- Generic territorial I/O multipliers for affected industries.
- Economic profiles of affected communities and industries will help provide background for use of the local planning teams and for the preparation of management plans.

* If available from RR, information on direct employment from establishment and operation of the PA.

- Where information is available, estimates of employment, income and output impact for *significantly-affected* industries or businesses.
- If tourism visitation projections or boilerplate estimates are available for the proposed PA, rough estimates of employment, income and output impacts.

Government Revenues And Expenditures

- If tourism visitation projections or boilerplate estimates are available for the proposed PA, rough estimates of net impact on revenues and fees.
- If available from RR, estimates of direct costs of PA establishment and operation costs.
- Where information is available for *significantly-affected* industries or businesses, estimates of indirect impact on government revenue and spending.
- *Where significant*, impact on other spending (compensation, infrastructure, government services).

Non-Monetary Economic Values

- Generic discussion as above (Step 1) and consideration of any significant non-monetary impacts.
- Consideration of local community values and interests.

OTHER ECONOMIC VALUES BOUNDARIES: STEP 5 — DESIGN FINAL

In general, assessment information about other economic values provided at the Step 5 stage will be similar to information provided at the Step 3 stage *(Select Study Area)*.

However, there may be requirements for more specific or additional assessment information about economic values from the Local Planning Team, Cabinet or the Development Assessment Process. Where there is relevant and reliable information available to develop more specific assessments, they will be provided.

Other Industry Sectors

- As above (Step 3), unless additional or more detailed information is required.

Major Economic Variables

- As above (Step 3), unless additional or more detailed information is required.

Government Revenues And Expenditures

- As above (Step 3), unless additional or more detailed information is required.

Non-Monetary Economic Values

- As above (Step 3), unless additional or more detailed information is required.

OTHER ECONOMIC VALUES PREPARE MANAGEMENT PLAN: STEP 9

Most of the specific information required for a reliable assessment of the economic impact of protected area will not be available until the management planning stage, which will determine what types of activities and facilities will be allowed and/or restricted in the protected area. At the management planning stage, there should also be a much clearer estimate of the spending and employment related to park operations and of the likely levels and types of visitation and fees.

However, these estimates will depend strongly on the accuracy and detail of information provided in other assessments. In particular, it will be very difficult to assess the economic value of foregone opportunities in the resource sector, particularly where no industries are in operation. Economic impact models can be used to estimate the impacts of park management and visitor spending on different variables and sectors of the economy.

While prospective estimates can be made of the potential economic benefits of a protected area on the tourism sector and local economies, the level of benefits will depend largely on the capacity and ability of local operators to take advantage of the economic opportunities associated with a protected area. Management planning for a protected area should include measures to help local communities maximize the potential economic benefits of the protected area.

Other Industry Sectors

- Clear information about allowable activities within the protected area will permit an estimate of the impact of the proposed PA on employment, income and production on other industry sectors, such as agriculture, trapping and other commercial activities.

Major Economic Variables

- Specific quantitative data about the impacts of alternatives on different sectors and on tourism levels, as well as projections of park management cost and operations, can provide information required to use in an economic impact model.

Government Revenues And Expenditures

- Estimates of the impact on government revenues and expenditures can be made,

based on the impact on economic variables, projected visitation levels and on an assessment of the indirect impacts on government spending and infrastructure requirements.

Non-Monetary Economic Values

- Consideration of whether and how alternatives and mitigating measures will significantly affect non-monetary economic values.

Yukon Protected Areas Strategy: Implementation review

Appendix 3: Multiple Accounts Analysis Summary

Table of Contents

1.0 INTRODUCTION.....88

2.0 ACCOUNTS AND VALUES.....88

3.0 YPAS STEPS AND MAA ACTIVITIES.....89

4.0 EVALUATING OPTIONS: THE MULTIPLE ACCOUNTS ANALYSIS SUMMARY TABLE.....94

5.0 ACCOUNTING FOR SPATIAL AND TEMPORAL IMPACTS.....96

6.0 SUMMARY.....96

TABLES

Table 1: Multiple Accounts: Potential Values and Indicators.....5-8

Table 2: Example of Multiple Accounts Analysis Summary Table.....8-9

Table 3: Application of Multiple Accounts Analysis in the YPAS Process.....11

Note:
While this paper will guide the integrated analysis of technical work of government departments, it does not necessarily reflect Yukon Government policy with respect to how final decisions are made related to the establishment of protected areas.

Appendix 3: Multiple Accounts Analysis summary
Prepared for: Economic Development, Yukon, December 2000

1.0 INTRODUCTION

Multiple Accounts Analysis (MAA) is a tool that is designed to assist in – but not replace – social decision-making. It identifies the implications of each of a series of scenarios for each of the values identified and identifies potential trade-offs between scenarios.

Multiple Accounts Analysis involves setting up a series of accounts – environmental, social & cultural, and economic accounts, for example – to organize the predicted impacts of each option being considered.

In cost-benefit analysis, an alternative to MAA, all impacts must be translated to dollar values, which can be very difficult to estimate, particularly for environmental, social and future economic values. In multiple accounts analysis, data in the accounts can be qualitative as well as quantitative. MAA is also designed to allow the public and decision-makers to focus on the key trade-offs required by the different options.

MAA is a flexible tool and can be structured in a number of ways. It can be used at different steps of the YPAS process, including comparisons of:

- Options for Areas of Interest
- Options for Study Areas
- Options for final boundaries
- Options for management plan

However, it is important to note that MAA is a tool designed to typically help evaluate and rank options against each other and/or against a "base case". It provides the information required in making judgements and decisions among different options. It is not a tool used to identify options, although some MAA information might lead to option selection and mitigation measures. Most importantly, MAA is intended to facilitate decision-making by identifying the trade-offs that may be required; it does not provide a formula that will produce a decision.

The Yukon Protected Areas Strategy process is designed to ensure that areas of high resource potential – and therefore costly trade-offs – are avoided where possible. Where trade-offs *are* necessary, the Multiple Accounts Analysis provides a framework for a comprehensive and transparent assessment of the pros and cons of each option. In contrast, a cost-benefit analysis of proposed protected areas would involve a less transparent process together with reliance on hypothetical assumptions about future conditions and impacts.

2.0 ACCOUNTS AND VALUES

Multiple accounts analysis starts with the identification of accounts and sub-accounts, which represent the values that are of interest to decision-makers. Based on the accounts identified in the Protected Areas Strategy and the values identified in the Assessment Summary Reports (Appendix 2), three major sets of accounts – Environmental, Social & Cultural, and Economic – have been identified. These accounts and possible values and indicators are presented in Table 1.

3.0 YPAS STEPS AND MAA ACTIVITIES

Multiple accounts analysis is a flexible tool that can be used by comparing options against each other or against a "base case" (a comprehensive statement of what the values would be under the status quo with, for instance, no protected area established). It is widely used in British Columbia's Land and Resource Management Planning (a comprehensive land use planning process) using a base case against which different options are compared in an already defined region.

In the Yukon, protected areas planning is likely to occur in many areas before comprehensive land planning takes place. The Yukon Protected Areas Strategy, the region is not clearly defined at the outset: much of the process involves a step-wise process of gradually selecting more specifically defined areas until final boundaries are determined. In this case, defining and establishing a base case with detailed information for all the values in the entire potential region would be impractical as it would require a costly and time consuming exercise involving the collection of much information that may be irrelevant to the decisions required or not readily available.

Instead of collecting detailed data up-front for a base case, MAA will be used in the YPAS process to compare the impact of alternative options against each other, using more detailed information as it is required at each successive step of the process. MAA can be best used to highlight advantages and disadvantages of different options where clear trade-offs are required.

In Step 1 of the YPAS process, the emphasis is on undertaking an assessment of natural (environmental) values to identify areas that represent the ecoregion(s), are ecologically viable, and natural in character. At the same time, resource values, including an evaluation of mineral, oil and gas and forestry potential, are assessed and compared to the natural values to identify areas of overlapping values. The process attempts to avoid areas of high resource use and potential where possible so that costly trade-offs are avoided in the establishment of protected areas. In this step, baseline data on natural, cultural, resource and some recreation/tourism values can be best represented spatially in the form of maps. Not all values can be represented spatially through mapping, but should be provided where possible.

At Step 1, it may not be necessary to collect detailed information about the impacts of different options on all the different values or to use a multiple accounts analysis if there are no significant trade-offs required. However, initial baseline information on relevant natural, economic and social and cultural values should be identified and collected at this time to initially determine the potential impacts of different options. Baseline information will help to provide an understanding of the current situation and the potential for future developments for each value.

In later steps of the YPAS process, the Local Planning Team may identify additional values and indicators to be included in the Multiple Accounts Analysis – and may also identify other areas of interest or study areas to be analyzed. Table 3 provides a summary of how Multiple Accounts Analysis can be applied to the YPAS process.

Many of the values may need to be represented through ordinal values (e.g. high, medium and low rankings) where more accurate cardinal values (e.g. numbers of sheep, or tonnes of ore) are not available. Where ordinal rankings are used, the rankings should be explicit on whether the rankings are in relation to averages for the region under consideration or for the Yukon as a whole. Where reasonably accurate cardinal values providing relative quantitative data are available, these should be used in order to provide the Local Planning Team and decision-makers with a good understanding of the relative advantages and disadvantages of the different options.

Table 1 contains a list of potential values and possible indicators for each of the accounts. While

some of the data will be quantitative, other data will only be available in a qualitative form. This Table is for illustrative purposes only. Specific details about what information will be collected and how assessments will be carried out at each step is provided in *Appendix 2: Resource/Values Assessment Summary Reports* and the associated *Technical Papers*.

In many instances, an initial assessment will determine that impacts on certain values would be minimal or insignificant. In these cases, further detailed assessment on these values will likely not be required. However, it is important to note that MAA is a flexible and transparent process that is well suited to the public and open protected areas planning process. If members of the Local Planning Team or the public identify specific values of interest or identify specific impacts, these may be incorporated into the Multiple Accounts Analysis.

Table 1: Multiple Accounts: Potential Values and Indicators

Accounts	Potential Values	Possible Indicators
Environmental Accounts		
Ecoregion Representation	Basic Landscape Features	➢ Physical landscapes -. elevation, hydrology, terrain features, glacial limits
	Geology and Soil Features	➢ Soil landscape units – parent materials, soil developments, bedrock geology, ➢ Geological Classification
	Unique Landscape Features	➢ Recreational features ➢ Unique landscape features
	Land Cover	➢ Vegetation communities ➢ Non-vegetated surfaces ➢ Forest types ➢ Ecological Stratification
	Biological Communities	➢ Key habitat ➢ Regional avian communities ➢ Wildlife communities
	Rare and/or Vulnerable Ecosystems	➢ Rare or limited habitats ➢ Key wetlands for waterfowl
	Ecological Diversity	➢ Inclusion of all of the above
Ecological Viability	Focal Species (Minimum Critical Area)	➢ Minimum Critical Area of Focal Species
	Fire Disturbance (Minimum Dynamic Area)	➢ Historical forest fire data – minimum Dynamic Area
	Minimum Reserve Area	➢ Minimum area for ecological viability
	Watershed	➢ Watershed-level planning ➢ Water quality considerations
	Shape	➢ Edge effects
	Key Habitat and Biological Communities	➢ Sources for biodiversity
Naturalness	Linear and Point Source Disturbance Density	➢ Site developments, mines, roads, seismic lines and transmission lines
	Introduced Species	➢ Introduced vascular plants & other species
	Connection to other critical ecological functions or to other protected areas	➢ Critical movement or migration corridors
	Adjacent Land Use	➢ Resource development activities

N.B. This is an illustrative list of values and indicators that may be considered, depending on each circumstance. In each case, impacts will be considered where applicable and practical and where options will have a significant and measurable impact on the indicators. Appendices 1 and 2 detail what and how specific assessments will be conducted at each stage.

Table 1: Multiple Accounts: Potential Values and Indicators (cont'd)

Accounts	Potential Values	Possible Indicators
Social & Cultural Accounts		
Public Use & Enjoyment	Aesthetic	Viewsheds, etc.
	Hunting	# of hunters using area # of animals harvested (by species)
	Fishing	# of fishers using area amount of fish harvested
	Wilderness travel	Indicator of popularity & use
	Other recreation	# Users & extent of use
	Access	Roads
Heritage, Cultural & Spiritual Values	Archaeological	Identified sites, potential areas & uniqueness
	Palaeontological	Identified sites, potential areas & uniqueness
	Heritage/Historic sites and legendary landscapes	Identified burial and other sites, potential areas & uniqueness
	Spiritual values	Consultation with elders, etc to determine
	Artistic values	Locations, consultations to determine
	Other traditional uses	Locations and uses: consultation with elders and others to determine
Public Education, Interpretation, Research	Education values Research values	Representative/unique gene pools and species Locations and level of existing and potential use for research and education purposes
Other Social Values/Services	Population	Population by age & sex Unemployment/dependency ratios
	Transportation infrastructure	Existing roads, airstrips and usage
	Municipal infrastructure	Water supply systems Sewage systems Recreational facilities
	Option, Existence and Bequest Values	Qualitative assessment of potential impacts of alternate options on these values

N.B. This is an illustrative list of values and indicators that may be considered, depending on each circumstance. In each case, impacts will be considered where applicable and practical and where options will have a significant and measurable impact on the indicators. Appendices 1 and 2 detail what and how specific assessments will be conducted at each stage.

Table 1: Multiple Accounts: Potential Values and Indicators (cont'd)		
Accounts	**Potential Values**	**Possible Indicators**
Economic Accounts		
Subsistence Uses	Hunting	Sites, areas, extent of use
	Fishing	Sites, areas, extent of use
	Gathering	Sites, areas, extent of use
	Seasonal residences	Sites, areas, extent of use
Economy wide	Employment	Impact on employment
	Income	Impact on income
	Gross Domestic Product	Impact on GDP
	Public sector expenditures at Federal, Territorial, Municipal and First Nation level	Impact on expenditures
	Public sector revenues at Federal, Territorial, Municipal and First Nation level	Impact on revenues
Tourism and Recreation	Rubber-tire tourism	# of tourists, length of stay, spending + potential
	Wilderness tourism-Hunting Outfitting	# of outfits, # of hunters, infrastructure, spending, animals taken + potential
	Wilderness tourism-Fishing camps	# of outfits, # of fishers, infrastructure, spending, fish harvested + potential
	Wilderness tourism-Outdoor recreation	# of outfits, # of users (parties/ individuals), nature of trips – canoe/kayak, rafting, hiking; flightseeing, infrastructure, spending
Mineral Industry	Mining	Mineral potential Existing interests (claims)
Oil and Gas Industry	Oil and Gas	Oil and Gas potential Existing interests Impact on infrastructure (e.g., pipeline)
Forestry	Forestry	Forestry potential Existing interests
Renewable Energy	Hydro, Wind Distribution system	Existing & potential Hydro and Wind Sites Existing & potential infrastructure
Other Resource Industries	Trapping	Traplines, furs harvested
	Agriculture, Fishing	Existing operations and potential
Other Industries	Transportation	Impact on existing and potential access and operations and in relation to other industries Impact on road construction and maintenance material & quarries
	Construction	Impact on existing and potential operations
	Retail & wholesale trade	Impact on existing and potential operations, employment, sales
Other Industries	Food and accommodation	Impact on existing and potential operations, employment, sales
	Manufacturing, arts & crafts	Impact on existing and potential operations, employment, sales
	Other services	
	Direct Protected Areas related contracts and jobs	Spending, jobs & income

Economic value of ecosystem processes	CO_2 scrubbing & sink, air and water purification, fish production & wildlife reproduction and impact on other ecosystem processes	Qualitative assessment of whether options will have a significant impact on these values
N.B. This is an illustrative list of values and indicators that may be considered, depending on each circumstance. In each case, impacts will be considered where applicable and practical and where options will have a significant and measurable impact on the indicators. Appendices 1 and 2 detail what and how specific assessments will be conducted at each stage.		

4.0 EVALUATING OPTIONS: The Multiple Accounts Analysis Summary Table

Multiple Accounts Analysis is a tool for evaluating options in relation to each other. It provides information to assist in making judgements and decisions on different options. It is up to the Local Planning Team and other decision-makers to weigh the advantages and disadvantages of each value according to their own judgement.

The outputs of the MAA need to be provided in summary form since they will be used by Local Planning Teams and government decision-makers (ultimately the Yukon Cabinet) to compare and evaluate options. It will be incumbent on those who prepare the MAA to summarize a large amount of technical, quantitative and qualitative data and analysis into a simple format.

The MAA Summary Table should be presented in matrix/tabular form, with the information summarized in each box in the table. The first column should list the accounts being considered. A second column could include a short description of the broad objectives relating to each of the accounts to help set a context for decision-makers when considering the advantages and disadvantages of each option. For each specific option being considered, there should be a column with a short summary of the advantages and disadvantages of each option for each value. An example of an MAA Summary Table is presented below.

Table 2: Example of Multiple Accounts Analysis Summary Table

Account	Objectives	Option 1	Option 2	Option 3
Environmental Accounts				
Ecoregion Representation				
Ecological Viability				
Naturalness				
Wildlife and habitat				
Uncommon features				
Social & Cultural Accounts				
Public use and enjoyment				
Heritage, cultural and spiritual values				
Public education, interpretation, research				
Other social values/services				

Economic Accounts				
Subsistence uses				
Economy wide				
Tourism and recreation				
Mining Industry				
Oil and Gas Industry				
Other Resource industries				
Other industries				
Economic value of ecosystem processes				

N.B. No weighting of the accounts or values is implied in this table. It is up to the public, local planning team and decision-makers to determine what trade-offs are appropriate.

The information in the summary table should be provided in a form that allows decision-makers and the public to focus in on the key impacts and trade-offs differentiating each option. In some cases, there may be little difference between the impact of the different options on some of the values and this should be indicated. Detailed information for each account underlying the summary would be made available to the Local Planning Team, government and the public.

An MAA summary table can be prepared for each stage in the YPAS process where there are specific and distinct options being considered and where different options would have an identifiable impact on values of significance. The process used should be iterative and flexible. At some stages, there may not be distinct options and/or the trade-offs may not be significant. In these cases, it may be more efficient to use a map-based exercise to consider avoiding or including key areas rather than undertaking a comprehensive assessment of the impact on all values.

Most of the narratives in the MAA summary table will probably be qualitative evaluations. Some options would have no significant impact on some of the accounts. Some of the accounts will lend themselves to a mixture of qualitative and quantitative evaluations, while others could have strictly quantitative evaluations. For example, Option 1 might mean that 5% of the high mineral potential area and 35% of the high value sheep habitat of the Northeast Yukon would be included in a protected area.

Where possible, an estimate of the economic impact of the options would be included in either quantitatively or in relative qualitative terms. However, because resource projects are dependent on market conditions and prices, calculation of opportunity costs are difficult to estimate without information about specific project and infrastructure costs revenues and anticipated market conditions.

5.0 ACCOUNTING FOR SPATIAL AND TEMPORAL IMPACTS

Impacts can be identified and assessed at different geographic levels, including: local (e.g. ecoregion or area of interest), territorial (Yukon), transboundary (NWT, BC, Alaska), national (Canada) and global. The main focus of analysis in YPAS will be at the local and area of interest level, although these will be considered in relation to their impacts on a broader scale.

Environmental impacts will primarily be considered in terms of local ecoregion(s). Social, cultural and economic impacts can be assessed by identifying a "zone of local impact" for each protected area being considered. This zone would include the Yukon communities that would be directly affected by potential protected spaces as well as local First Nation traditional territories.

Where impacts have a temporal dimension, it should be clearly identified in the MAA matrix. For this process, the following guide can be used:

- short-term: one to five years
- medium-term: five to ten years
- long-term: over ten years

6.0 SUMMARY

Multiple Accounts Analysis is a flexible and transparent method of considering the different impacts of alternate options on a range of different values. It assists in – but does not replace – decision-making by helping to summarize a large amount of information into a simple format. MAA does not need to be used at all steps of the Protected Areas process: it is best used to consider trade-offs when there are distinct options that have identifiable impacts on different variables.

Table 3 provides a summary of how Multiple Accounts Analysis can be applied to different steps in the YPAS process.

Table 3: Application of Multiple Accounts Analysis in the YPAS Process		
YPAS Step	**Assessments and Information Required**	**Type of Analysis**
Step1A: *Determine Priority Ecoregions*	• Identify priority ecoregions at a territorial level.	
Step1B: *Identify Areas of Interest*	• Priority on natural value assessments to identify representative, viable and natural areas of interest within each ecoregion. • Cultural and heritage assessments, particularly in Protected Area SMAs • Mineral, oil & gas, other resource and tourism/ recreation assessments to identify areas of high potential and avoid conflicts where options exist. • Review existing interests and other values as required.	Primarily map-based analysis. Use of MAA to decide between options with distinct trade-offs. Preparation of values and assessment report, maps, and areas of interest options paper.
Step 2: *Establish Local Planning Team*	• LPT receive assessments and papers for their review.	
Step 3: *Select Proposed Study Area*	• *Public workshop #1:* LPT and public to suggest priority values for assessments, other options for areas of interest, and provide local knowledge input to assessments.	
	• Detailed environmental, resource, social, cultural and economic assessments on final areas of interest to identify a proposed study area.	Map-based analysis and MAA to describe relative merits of different areas of interest.
	• *Public workshop #2:* Public input to consider impact of various options and to provide local knowledge on the proposed study area.	Preparation of study area options paper for public meeting, including MAA of different options. Preparation of study area proposal.
Step 4: *Approve Study Area & Interim Protection*	• Additional information if required by Cabinet.	Map-based analysis and MAA to Cabinet for review.
Step 5: *Design Protected Area Boundaries*	• Additional detailed assessments, research and incorporation of local knowledge to identify final boundary issues.	Primarily map-based analysis. Use of MAA if required to decide between final boundary options with distinct trade-offs.
Step 6: *Refer Final Proposal to DAP*	• Additional information and assessments if required by the Development Assessment Process. *(YPAS and DAP are being developed in co-ordination to reduce the likelihood of duplication of effort)*	
Step 7: *Approve Protected Area Boundaries*	• Additional information if required by Cabinet.	Map-based presentation and MAA if required to Cabinet for review.
Step 8: *Designate Protected Area*		
Step 9:	• Additional assessments and collection of	Use of MAA if required to decide

Prepare Management Plan	information required for management planning. • Public input on values, local knowledge and management planning options.	between options with distinct trade-offs – based on objectives set for each protected area.